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ABSTRACT

This study marks the completion of basic research and analysis for a proposed regional college of veterinary medicine to serve the New England states and New Jersey. Following introductory material, procedures for collection and analysis of data are discussed. Chapters cover programs for fulfilling regional needs, size and organization of the proposal college, the optimum location for the proposed college of veterinary medicien, costs of the proposed college, sources of non-state appropriated funds, and equitable basis for state participation. Appendices include related material. (MJM)

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college of veterinary medicine for new england and new jersey

a feasibility study

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PREFACE

This important study marks the completion of basic research and analysis for a proposed regional college of veterinary medicine. It has been reviewed and accepted by the Executive Committee of the New England Board of Higher Education.

An earlier companion study set forth and established the need for such an institution to serve the training and research needs of New England and the State of New Jersey. This present work carefully, exhaustively, and accurately spells out the economics and logistics involved with establishing the proposed college at either of three state universities: the University of Massachusetts, the University of Connecticut, or Rutgers, the State University of New Jersey.

All advisors to this Board for this research agreed on one essential criterion: the proposed college must be part of a university operating an accredited medical school. Every institution in the seven-state region which encompassed a medical school was thus queried as to interest in being considered and evaluated as a potential location for the proposed college. All facilities in the region which might contribute to or benefit from association with the proposed college were taken account of in the findings of the study. The most recent national standards and data relating to colleges of veterinary medicine were used. In many ways, therefore, the report stands as both an up-to-date guide for regional decision and as a national model of reliable information.

Some will scoff at the concept of a regional institution of higher education, particularly at the idea of seven states cooperating in payment of both capital and operating costs, let alone reaching agreement as to location and governance. The New England Board believes differently as this report gives evidence. We are sanguine that widsom will exceed particularism in this case and that the governments, the educational leaders, the professional veterinarians, and all who understand the importance of animal health and its essential relationship to human health and welfare will support the basic recommendations of this report.

The Board stands in debt to Dr. Clarence R. Cole as director of research and author of this study. Few, if any, other persons possess the knowledge of the field held by Dr. Cole and none could have brought to the task the research expertise and diligence he exhibited. He was ably assisted by Dr. Laverne D. Knezek as Project Supervisor and Research Associate and by Judith L. McFarland as Research Assistant. The Board is also obligated to the members of its special Advisory Committee who gave freely of their time and advice, as well as to those many professional veterinarians whose support and enthusiasm for our work never flagged. Dr. David M. Wax, Assistant Director of NEBHE was responsible for overall project supervision, while the report was edited by Raymond G. Hewitt, Associate Director of Research and Development at NEBHE. Sally M. Kennedy and Lillian B. Greeley, Staff Associates and Suzanne W. Fullerton, Editorial Assistant at NEBHE were scrupulous in their devotion to the task of preparing the manuscript under the direction of

Joan-Faye Livergood, Assistant Director of NEBHE. The Board is confident that all of these labors will result in an institution which will be not only the first of its kind, but also a major asset and addition to the outstanding academic community of the region.

Alan D. Ferguson
Executive Director
New England Board of Higher Education

August 1973

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The authors wish to acknowledge the assistance of Dr. Alan D. Ferguson, Executive Director, NEBHE, and Dr. David M. Wax, Assistant Director, NEBHE, who conceived and outlined the objectives for the study, arranged the funding, and handled the overall administration; also acknowledgment is made of the advice given by Raymond G. Hewitt, NEBHE, and Mitchell Wendell, Attorney at Law.

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RECOMMENDATIONS

A FEASIBILITY STUDY TO ESTABLISH A COLLEGE OF VETERINARY MEDICINE IN THE NEW ENGLAND AND NEW JERSEY REGION

This study was conducted to pursue the recommendations arising from prior research which established the need for a college of veterinary medicine to serve the New England states and New Jersey.[1] Alternative plans for developing the proposed college were investigated, taking into account logistical and economic parameters.

The objectives of the study were to determine:

1. trends in educational practice through a study of existing veterinary college curricula;
2. the optimal location for the college;
3. capital and operating costs of an appropriate college, taking into account regional needs and current regional resources;
4. possible sources of funding (state, federal, and private) currently available or likely to be available and the pertinent eligibility requirements for such funding;
5. an equitable formula or formulas for shared participation in the capitalization and operational funding of the college by the New England states and New Jersey.

The findings of this study lead to the conclusion that it is feasible to establish a veterinary college to serve the seven-state region.

RECOMMENDATIONS

Programs for Fulfilling Regional Needs

1. The presence of human medicine and veterinary medicine on the same campus offers the opportunity for cooperation between the two in educational programs.

This study RECOMMENDS that the proposed college of veterinary medicine strive for flexibility in structuring its educational program in a manner which will utilize existing courses and facilities in a medical school and also enhance the development of comparative medicine and the study of animal models of human diseases in a health center. The faculty should have the opportunity to

[1]THE NEED FOR A COLLEGE OF VETERINARY MEDICINE TO SERVE NEW ENGLAND AND NEW JERSEY, New England Board of Higher Education, 1973.

choose elements from the lecture-laboratory, independent-learning, and core-elective approaches and to weigh cost-benefits and educational merit as important selection criteria.

2. The existence of internationally renowned institutions of higher education in the New England-New Jersey region is an incentive for establishing an elective program, or tracks, as a part of a curriculum which would offer unique professional development for the student.

This study RECOMMENDS that an elective program, or tracks, be established which will enhance the Doctor of Veterinary Medicine (D.V.M.) degree program by offering the student a wide range of intramural and extramural opportunities for concentrated study in areas of his interest and consistent with the needs and resources of the seven-state region. Electives may allow the student to study a variety of topics at renowned medical schools and at other institutions in the region such as the New England Regional Primate Research Center, Angell Memorial Animal Hospital, New Jersey Animal Health Laboratory, Massachusetts Institute of Technology, and marine and industrial laboratories.

3. The internship program, which provides the individual with the opportunity to apply the principles he has learned during the formal portion of his D.V.M. program and to take advanced course work, is currently offered at 10 of the 21 veterinary colleges in the United States and Canada. Even with these and other valuable internship programs, the number of applicants is greater than the number of spaces.

This study RECOMMENDS that the new college implement a flexible internship program as a part of the post-D.V.M. education offerings.

4. Residency programs are designed to prepare individuals for examination and certification by specialty boards recognized by the American Veterinary Medical Association (AVMA) and are offered by 8 of the 21 veterinary colleges in the United States and Canada. As with internship programs, the number of applicants for residency programs far exceeds the number of spaces available.

This study RECOMMENDS that the new college establish residency programs in fields where specialty boards are recognized by the AVMA.

5. Veterinarians with advanced education in all fields of specialization are necessary to provide specialists for practice and research and teaching positions. Many M.S. and Ph.D. programs relating to veterinary medicine currently exist in the seven-state region; however, they do not encompass all of the fields of comparative medicine in which an advanced degree should be available.

This study RECOMMENDS that the new college establish flexible graduate programs (a) complementing the M.S. and Ph.D. programs currently in the seven-state region, and (b) primarily emphasizing advanced degree programs in areas which do not have residency education leading to certification by a specialty board recognized by the AVMA.

6. Continuing education is designed to enhance the professional competence of veterinarians and thus improve the quality of veterinary medical services. Facilities and personnel required for other educational and research programs of the college can also serve continuing education programs. The desires and educational objectives of all the veterinarians within the seven-state region should be considered in designing continuing education program offerings.

This study RECOMMENDS that the college, in cooperation with the veterinary medical associations in each participating state, develop a broad spectrum of programs needed by practicing veterinarians in the seven-state area. Adequate support services should be provided by the college.

7. The animal technician is a valuable asset to the practicing veterinarian, aiding him in patient care and offering other vital services. Five institutions in New England and New Jersey offer educational programs for animal technicians.

This study RECOMMENDS, after the D.V.M. program is well established, development of ways to enhance animal technician programs in existing schools of the region. The same space, equipment, and animal resources provided for the D.V.M. program could be utilized by such a technician training program; the students in animal technology, for example, might complete the first year in one of the existing schools in the seven-state region followed by part or all of the second year in the teaching hospital of the college of veterinary medicine. The college of veterinary medicine, however, should *not* initiate a totally new animal technician program.

8. Multiple activities of education, research, and patient care are essential and interrelated ingredients comprising the educational environment. Research enhances the health and well-being of people, improves the economic status of the region, and promotes industrial development dependent upon technological discoveries.

This study RECOMMENDS that the proposed college (a) institute a research program in collaboration with the other medical and biomedical teaching and research institutions in the region, and (b) retain flexibility to meet the unique needs of the seven-state region.

9. The trend to examine the effectiveness of programs and the stress on accountability are promulgated by state governments in response to rapid changes that are taking place in all areas of instruction, including veterinary medical education.

This study RECOMMENDS that the college should engage in continuous evaluation of the quality and economy of its programs to maintain dynamic response to societal demands and available resources.

Size and Organization of the Proposed College

10. Because the college is serving the needs and utilizing resources of seven states rather than one, it is important that the college be large enough to accommodate these needs.

This study RECOMMENDS that the proposed college be sufficient in size and coverage to offer high-quality education, research, and service programs commensurate with those programs offered by the renowned biomedical institutions in the New England and New Jersey region.

11. The mix of different levels of students in a college of veterinary medicine is an important factor in planning. A useful means of estimating college size is examining the size of existing colleges of veterinary medicine and comparing these figures with regional needs.

This study RECOMMENDS that the college be planned to accommodate 1114 students including 384 veterinary students; 100 residents, interns, and graduate students; 600 part-time continuing education students; and 30 technical students. It is further RECOMMENDED that the college open with an initial class of 64 veterinary students and enlarge to an entering class of 96 students as rapidly as qualified faculty can be recruited.

12. A veterinary teaching hospital is essential for providing animal patients representing the maximum number of species and spectrum of diseases for instruction of all levels of students including four classes of veterinary students. If the teaching hospital renders high-quality service, it will attract sufficient numbers of patients to serve the educational and research requirements.

This study RECOMMENDS that the veterinary teaching hospital should accommodate at least eight small animal patients, one equine patient, three mammalian food-animal patients, and a total of five laboratory animal, avian, marine, zoo and wildlife patients per senior veterinary student.

13. A veterinary medical library should have at least 30,000 bound volumes and serial subscriptions to meet educational and research needs. The library must also be large enough to accommodate the technological advances in usage of varied learning media.

This study RECOMMENDS that the veterinary medical library be a part of a learning resources center and be designed for 30,000 volumes plus a varied learning media area equivalent to space for 15,000 volumes.

14. The minimum size of colleges of the health professions is determined by the minimum number of faculty specialists required to (a) teach all of the essential disciplines and specialties, (b) teach all levels of students, (c) provide excellent patient care as a model for students, (d) provide a highly competent referral service, (e) conduct a diagnostic laboratory, (f) achieve excellence in research, and (g) be responsive to demands for university-wide and community service. The magnitude of faculty responsibilities and the number of faculty at existing colleges of veterinary medicine were evaluated.

This study RECOMMENDS that, by the fourth year of operation, the minimum number of faculty required be 64 plus 12 department heads, dean, hospital administrator, and directors. Thereafter, expansion to accommodate a

total of 1114 students at all levels and to undertake other college functions will require a mininum of 96 faculty plus 12 faculty/administrators. The requirements for technical, clerical, custodial, and other non-faculty personnel (support staff) should be calculated using a ratio of three staff to one faculty member.

15. Development of schools of medicine and veterinary medicine in close proximity within a health center helps to promote efficiency and enhance quality of the programs. The service and research activities of a college of veterinary medicine are also benefited by collaboration with a college of agriculture located within the same university. Parallel administrative structure facilitates this collaboration.

This study RECOMMENDS that the college of veterinary medicine be developed in a health center in close association with the school of medicine and that functional relationships be developed with other colleges in the university. In accordance with accreditation requirements, the dean of the college of veterinary medicine should appear in the organizational structure at an administrative level parallel to the deans of other colleges of the health professions.

Location

16. Selection of an optimal location for the interstate college is one of the most important aspects of this study.

Each potential location was assessed by using a set of criteria outlining important elements of a desirable location. Data from those campuses expressing a desire for the college were assessed, and the site which best met these criteria was selected. On the basis of this information, this study RECOMMENDS the placement of the proposed veterinary college for New England and New Jersey on the site of the University of Massachusetts Medical School at Worcester. Establishment of the veterinary college at this location will provide a centralized facility to serve the entire region and also will enhance the educational environment of veterinary and human medicine.

17. This study further RECOMMENDS that the basic veterinary medical sciences facility be attached to the existing building housing the basic science departments of the medical school. This will result in expansion of the existing departments; for example, physiology will be expanded to include veterinary physiology; anatomy will be expanded to include veterinary anatomy; microbiology will be expanded to include veterinary microbiology; and pharmacology will be expanded to include veterinary pharmacology.

18. This study RECOMMENDS that the existing library in the medical school at Worcester, which can provide over 19,000 square feet for veterinary medical use, be shared by the medical school and the college of veterinary medicine.

19. The veterinary teaching hospital, which is crucial to the functioning of the entire college of veterinary medicine as well as an asset to the medical school, should be located so as to be accessible to the entire health center but not immediately adjacent to the human hospital.

This study RECOMMENDS that the veterinary clinical facility be located approximately four minutes walking distance (800 feet) from and adjacent to the basic science departments of the veterinary college.

20. A veterinary medical research farm is a requirement for all colleges of veterinary medicine. This study RECOMMENDS that Massachusetts assign 250 acres of land for a veterinary medical research farm from holdings of the Worcester State Hospital or Notre Dame Institute (both located adjacent to the University of Massachusetts Medical School) or the Grafton State Hospital (located approximately five miles from the University of Massachusetts Medical School).

Costs of the Proposed College

21. The availability of acreage for the proposed college of veterinary medicine is an important factor in consideration of a potential site. This study RECOMMENDS that, inasmuch as the University of Massachusetts Medical School has adequate land available for veterinary medical use, the cost of purchasing land should not be a factor in calculating the cost of the college.

22. Space-planning factors applied to institutional data, including numbers of faculty and various levels of students, result in an estimated requirement for the proposed veterinary college of 258,050 net assignable square feet (397,000 gross square feet).

The calculation of construction costs of a model college of veterinary medicine involves a number of factors, such as cost per gross square foot and a percentage escalation factor for inflation. The cost of a model regional college in 1974 was calculated at $50.98 per gross square foot, including an eight percent annual escalation factor. Deductions were then made for the value of existing facilities to be shared at the University of Massachusetts Medical School.

This study RECOMMENDS that facilities of the medical school be shared with the new college of veterinary medicine for a sizable savings in costs. Calculations indicate that the new college requires an appropriation of $17,836,900 for construction of facilities plus $1,783,700 for architectural, engineering, and other fees. At the time construction is completed, movable equipment requirements will be an estimated $2,675,500. The appropriation required is calculated by deducting the value of shared facilities at the University of Massachusetts Medical School, $3,002,700, from the projected cost of a model college in 1974, $25,298,800, which includes fixed equipment, architectural and engineering fees, and movable equipment. The result is a balance of $22,296,100 to be appropriated for capital costs, less an amount up to 75

percent which conceivably might be provided by the Federal Government and private sources.

23. A financial plan for operating the college on a continuing basis is a major consideration in developing a new college. Based on the net expenditures approach, this study RECOMMENDS that annual operating funds be phased up to $4,185,000 in the fourth year of operation. Estimated income from tuition, fees, earnings and Federal grants and contracts would reduce the total necessary appropriation by the seven state legislatures to $2,626,960.

24. Start-up expenditures are minimized by adherence to a short yet feasible timetable. This study RECOMMENDS that the decision to found the interstate college of veterinary medicine be made by July 1974, along with an initial appropriation of $280,000 and appointment of a dean and his staff for planning purposes; that construction of the veterinary teaching hospital and all facilities not attached to the medical school start by July 1976; that construction attached to the medical school facilities start by January 1977; and that the first-year class of veterinary students enroll in September 1978, utilizing temporary and shared medical school facilities.

Sources of Non-State Appropriated Funds

25. Although federal statutes currently authorize the support of several programs in a college of veterinary medicine, it is not feasible to include federal funding in the development of the budget for the proposed college because the level of appropriations and availability of such funds are uncertain from year to year. Other sources of funds are similarly unstable and uncertain from year to year. Therefore, state appropriations must provide the fundamental support of veterinary colleges.

This study RECOMMENDS that the new college be funded by the participating states for both construction and operating purposes.

26. It is essential that college administrators seek federal participation in construction with utmost vigor and expertise. If the college is successful in obtaining federal funds for construction, this study RECOMMENDS that such funds obtained be used as a credit proportional to the amount of capital participation by each state.

27. State-supported universities strive to build endowments and acquire funds for special projects from foundations and private donors as well as from federal agencies.

This study RECOMMENDS that the veterinary college be aggressive and skillful in seeking financial support of its programs from foundations, industry, and private donors, as well as from federal agencies.

28. A significant portion of the funds needed to support the educational process may be provided by tuition. Since in general the annual cost of education for veterinary students is similar to that for medical students, this study RECOMMENDS that the level of tuition for veterinary students be identical to that for medical students on the same campus.

Equitable Basis for State Participation

29. Since it is proposed that the regional college of veterinary medicine serve seven states, a fair plan for allocating student spaces must be devised.

Because a high positive correlation exists between state population and the number of qualified residents in the region who apply for admission to a veterinary college, this study RECOMMENDS that each state be allocated veterinary student spaces in the same proportion that the population of each state is to the total seven-state population.

Table I indicates how the spaces for professional students would be allocated during the fourth year of operation of the college.

TABLE I. D.V.M. Student Space Allocation by State in the Fourth Operating Year*

State	*Percent of Total Population*	*Student Space*
N.J.	37.8	97
Mass.	29.9	76
Conn.	15.9	41
Me.	5.2	13
R.I.	5.0	13
N.H.	3.9	10
Vt.	2.3	6
Total	100.0	256

*This table includes only D.V.M. students. There will be an additional 130 residents, interns, graduate and technical students and 600 part-time continuing education students by the fourth year of operation.

30. Costs and benefits of an interstate veterinary college must be weighed in considering formulas for shared funding of capital and operating costs. The college will provide educational opportunities for the citizens of seven states, and the value of veterinary medical services provided by its graduates can be measured by (a) the improved health and well-being of the people, and (b) the improved economic status of the people. The health and economic benefits of a veterinary college and its graduates to the citizens, and the financial capability of the states, are closely related to the populations of the states. Therefore, this study RECOMMENDS that each of the seven states contribute its part of the cost of construction based on its population as reported in the official population estimate of the U.S. Bureau of the Census. Further, in order to assure stability of the college, the study RECOMMENDS that each state contribute a

prorated share of movable equipment and operating costs based on its population. The cost of the college thus will not place an undue burden on any one state.

Table II estimates the sum that each state would be required to contribute toward the cost of construction of the proposed college. This represents an estimated maximum since it assumes no federal or private support for construction, support that could reduce the state shares by as much as 75 percent.

Table III indicates the estimated sum that each state would be required to appropriate for movable equipment (a one-time charge) and operating costs in the fourth year of operation of the proposed college.

TABLE II. Maximum Estimated State Contributions for Construction Costs*

State	*Percent of Total Population*	*Maximum Estimated State Contribution*
N.J.	37.8	$ 7,408,800
Mass.	29.9	5,860,400
Conn.	15.9	3,116,400
Me.	5.2	1,019,200
R.I.	5.0	980,000
N.H.	3.9	764,400
Vt.	2.3	450,800
Total	100.0	$19,600,000

*Federal and private sources not included. The Comprehensive Health Manpower Training Act of 1971 authorizes up to 80 percent as the federal share of construction costs of a new veterinary college; the amount of federal funds which will be released between 1975 and 1978 is unknown. Non-state funds obtained for construction will decrease proportionately the contribution from each state.

TABLE III. Estimated State Contributions for Moveable Equipment and Fourth Year Operating Costs*

State	*Percent of Total Population*	*4th Year Operating*	*Initial Moveable Equipment*
N.J.	37.8	$ 992,991	$1,011,528
Mass.	29.9	785,461	800,124
Conn.	15.9	417,687	425,484
Me.	5.2	136,602	139,152
R.I.	5.0	131,348	133,800
N.H.	3.9	102,451	104,364
Vt.	2.3	60,420	61,548
Total	100.0	$2,626,960	$2,676,000

*This table includes only those operating costs that would be underwritten by state appropriations. Other sources of income, such as tuition and federal education subsidies, would increase the total fourth year operating budget to about $4,185,000.

31. Increased tax revenue, as well as indirect and intangible economic benefits, accrue to the state in which the regional college is located. These economic benefits should be offset by the value of contributions made by the host state to the college. Therefore, this study RECOMMENDS that Massachusetts provide the land, share facilities and equipment of the University of Massachusetts Medical School, and contribute the overhead costs for operation of the college.

32. A regional college constructed in one state raises the question of whether each of the other six states can legally finance capital costs for educational facilities located in another state. According to advice received by the New England Board of Higher Education from the Attorneys General of four of the seven states, there are no constitutional barriers in their states to participation in a regional college of veterinary medicine. Opinions from the three remaining Attorneys General are in preparation or will be requested when authorizing legislation is filed. Authorization and appropriation legislation would be required, however, for provision of capital and operating funds.

The study RECOMMENDS that uniform legislation authorizing the establishment of a regional college of veterinary medicine be introduced into the seven state legislatures. This study further RECOMMENDS that by July 1974 such legislation be passed and that each state appropriate its share, based on its population, of the $280,000 required for planning.

1. INTRODUCTION

The purpose of this study was to ascertain the feasibility of establishing a regional college of veterinary medicine for New England and New Jersey. Alternative plans for developing the proposed college were investigated, taking into account logistical and economic parameters. The study was undertaken to pursue the recommendations arising from prior research which documented the need for such a college.

BACKGROUND OF THE STUDY

In 1973 the New England Board of Higher Education (NEBHE) completed and published a study entitled *The Need for A College of Veterinary Medicine to Serve New England and New Jersey.* Although the present study is concerned with feasibility rather than need, it is helpful to review the major points of the "Need Study." The major findings of the publication are summarized as follows:

1. New England and New Jersey face a critical shortage of veterinarians by 1980.
2. Motivated and qualified New England and New Jersey students are currently being denied the opportunity to pursue a career in veterinary medicine.
3. The medical/scientific community in the New England states and New Jersey provides not only a foundation for such a college but also the interdisciplinary links necessary for a truly contemporary college of veterinary medicine.
4. Practicing veterinarians in these seven states are currently being denied the continuing education programs and referral services that a regional college can provide.
5. Shared construction and/or operating costs make such a regional college economically and logistically feasible for these seven states.

On the basis of the above observations and other information contained in the report, the following recommendations were made:

1. That a regional college of veterinary medicine be established within New England or New Jersey to provide an educational program leading to the doctor of veterinary medicine degree particularly for residents of these seven states.
2. That the proposed college be cooperatively founded and supported by the New England states and New Jersey.
3. That the capitalization of the college be a regional effort.

4. That the operating costs, once established, be shared equitably by the New England states and New Jersey.

5. That a formula(s) be devised assuring equitable participation by the seven states in capitalization and operational funding of the college.

6. That the proposed regional college of veterinary medicine be closely allied with a medical school whose library, research and clinical facilities will be available as a necessary complement to the veterinary medical program.

7. That these allied medical institutions be located so as to facilitate ready accessibility to the region.

8. That the functions of the proposed veterinary college include, in addition to professional education and research, the continuing education of veterinarians, consultation services, a local referral facility and extension activities.

The report also recommended that another study or studies be undertaken to determine the optimal location for the college; capital and operating costs, taking into account regional needs and current regional resources; possible sources of funding; an equitable formula or formulas for shared participation by the New England states and New Jersey in (a) capitalization costs, (b) operational funding, and (c) allocation of student spaces; and trends in educational practices in existing veterinary colleges. Consideration of these questions regarding the proposed college of veterinary medicine comprises the present report.

The report also recommended that the New England states, through NEBHE, undertake to secure contractual agreements with those colleges of veterinary medicine willing to accept New England residents under such an agreement so that regional needs could be serviced in the interim. It also recommended that New Jersey continue its own efforts in securing contractual spaces for its residents. Finally, the report recommended that findings and recommendations of the "Need Study" and subsequent studies be brought to the attention of appropriate state and national officials and professional associations.

OBJECTIVES OF THIS STUDY

On the basis of data reported in the "Need Study," the New England Board of Higher Education was directed by the New England Governors' Conference to undertake additional research as recommended in the report. Thus, the objectives of the present study were to determine the following:

1. Trends in educational practice through a study of existing veterinary college curricula;

2. The optimal location for the college;

3. The capital and operating costs of an appropriate college, taking into account regional needs and current regional resources;

4. The possible sources of funding – state, federal, and private – currently or likely to be available and the pertinent eligibility requirements for such funding; and

5. An equitable formula or formulas for shared participation in the capitalization and operational funding of the college by the New England states and New Jersey.

DELIMITATIONS

This study of veterinary medicine was delimited to the seven-state region of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, and New Jersey. The study was further delimited to the feasibility aspects only; therefore, details such as design of buildings, college and departmental organization, and curriculum development were not considered within its purview.

BASIC ASSUMPTION

It was assumed that the need for a college of veterinary medicine in New England and New Jersey had already been unequivocally established, as demonstrated by the research report entitled *The Need for a College of Veterinary Medicine to Serve New England and New Jersey.*

DEFINITION OF TERMS

For the purposes of this study, the following definitions were formulated:

Advisory Council on Veterinary Medicine. A group of distinguished individuals from each of the seven states, representing varied fields of activity, who were appointed by the New England Board of Higher Education to give advice and guidance to this study.

Candidate Campus. A specific university, school or college location which is a potential site for the regional college of veterinary medicine.

College of Veterinary Medicine (CVM). Synonymous with school of veterinary medicine, a health professional college offering the D.V.M. or V.M.D. professional degree, graduate degrees, and certification in veterinary medical specialties.

Comparative Medicine. The study of the phenomena basic to health and disease of all species of animals including man.

Continuing Education. A course or courses of study for veterinarians who receive specialized education as a supplement to their previous education and who generally are not pursuing a degree.

D.V.M. Doctor of Veterinary Medicine degree sought by professional students; V.M.D. and D.V.M. are equivalent.

Feasible. That which is capable of attaining the end desired without prevention by serious obstacles. Feasible refers to the ease with which something can be done and implies a high degree of desirability. *Organizational feasibility* concerns the readiness and flexibility of an institution to assimilate a veterinary medical college into its present structure or to change those structures so as to facilitate that assimilation. *Human feasibility* concerns the need for veterinarians, student demands for admission, and availability of qualified faculty. *Financial feasibility* is concerned with the capability of the New England and New Jersey area to meet the fiscal needs of the proposed college of veterinary medicine.

FTE Faculty (Full Time Equivalent Faculty). The term used which expresses the full and part-time faculty of an institution on a full-time basis. For example, four faculty members each devoting 25 percent of their time are considered one full-time equivalent faculty member.

FTE Student (Full Time Equivalent Student). An expression of the prescribed number of semester or quarter hours of study a full-time student assumes. The level of equivalency of a student is represented by his total semester or quarter hours of study during an academic period divided by the prescribed number of semester or quarter hours. For example, if the prescribed number of quarter hours of study is 15, and a student assumes a total of 10 quarters, he is a .67 FTE student.

Internship. A supervised program of instruction in the veterinary medical specialties, usually of one to two years duration.

Learning Resource Center. All resources available to faculty and students for facilitation of teaching and learning. These include libraries, photography, television, graphics, computer-assisted instruction, and programmed instruction.

Master Panel. Five noted professionals in the field of veterinary medicine representing different broad aspects of the profession who reviewed and evaluated the location methodology and results and provided advice on the cost of the proposed college.

New England Board of Higher Education (NEBHE). An organization authorized by the New England Higher Education Compact, a formal interstate agreement among the six states ratified by the U.S. Congress. It exists to

promote and develop activities which will expand educational opportunities for the people of the region and which will most efficiently utilize all of the region's higher educational facilities.

Need Study. *The Need for a College of Veterinary Medicine to Serve New England and New Jersey,* a study published in 1973 by the New England Board of Higher Education documenting the need for veterinarians and the large number of potential veterinary students in the New England and New Jersey region.

Post-D.V.M. Education in veterinary medicine beyond the first professional degree (D.V.M. or V.M.D.). Such education includes internships and residencies and work toward master's and Ph.D. degrees but excludes continuing education.

Preceptorship. An organized and voluntary program of practical training and experience sanctioned by the college and pursued before receiving the D.V.M. degree.

Professional Student. A student enrolled in the college of veterinary medicine in a program leading to the Doctor of Veterinary Medicine degree.

Residency. An organized program of advanced instruction designed to enable individuals to acquire exceptional proficiency and certification in veterinary medical specialties.

Satellite Facilities. Off-campus institutions, laboratories, and other facilities located near enough to a college of veterinary medicine that faculty, students, and facility personnel might have cooperative interchange involving instruction, research, and service.

Seven-State Region. New Jersey and the six New England states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

Support Staff. All non-faculty personnel on the college's payroll.

Technical Student. A student enrolled in a certificate or degree-granting program of two to four years duration leading to qualification as an animal technician or veterinarian's assistant.

Veterinary Medicine. The health profession concerned with the health and well-being of animals and man, the control of diseases transmissible from animals to man, and the discovery of new knowledge in comparative medicine.

Veterinary Science Department. Any department or equivalent organizational subdivision of a university that deals with veterinary science, such as animal diseases, animal pathology, and pathobiology.

2. PROCEDURES FOR COLLECTION AND ANALYSIS OF DATA

An important part of any study is careful selection of the procedures to be used in the collection and analysis of data. The objectives listed in Chapter 1 served as the basis for research designed to answer the overall questions involved in this feasibility study. As a result, data were collected on a number of different but sometimes interrelated areas. The methodologies which were employed will be discussed in terms of the objectives.

A seventeen-man Advisory Council on Veterinary Medicine was appointed by the New England Board of Higher Education (NEBHE) to serve as a source of input on the work being done at various intervals during the study. This Council consisted of a group of distinguished individuals from various fields of activity in each of the seven states in the New England and New Jersey area who were selected to give advice and guidance to this study.

EDUCATIONAL TRENDS

The current curriculum trends in veterinary medical education were identified. The primary sources of data used in documenting these trends included reports of symposiums and other meetings, bound documents, periodicals, and statistical information provided by government departments.

The needs and resources that are unique to the New England and New Jersey area were then identified. After both national educational trends and regional resources and needs were outlined, the educational practices which could be effectively implemented to meet the needs of the region, capitalizing on existing regional resources, were determined.

The data were used primarily for descriptive purposes and were therefore summarized. The recommended outline of the educational environment includes educational programs, research, and service activities in veterinary medicine, modified to meet the seven-state region's needs and resources.

SIZE AND ORGANIZATION

The size of a college is influenced by many factors, including the demand for its graduates, the number of students wishing to enroll, the number and quality of the programs of instruction and research, professional and community services, and the number of faculty and staff.

The demand for doctors of veterinary medicine in the region was obtained from the "Need Study" *(The Need for a College of Veterinary Medicine to Serve New England and New Jersey).* Questionnaires returned from state universities in the seven states, interviews with pre-veterinary medical advisors in New Jersey, Connecticut, and Massachusetts, and a survey of the number of applicants to the

University of Pennsylvania School of Veterinary Medicine yielded data on the trends of the number of qualified students wishing to enroll in a college of veterinary medicine. The number of students and faculty in each of the U.S. and Canadian veterinary colleges served as a basis for estimating the mix of different levels of students and the number of faculty and staff required for the regional college. An investigation of established patterns in sharing faculty and facilities between colleges of medicine and veterinary medicine located on the same campus served as the basis for estimating size and organization of the proposed college of veterinary medicine.

OPTIMAL LOCATION FOR THE COLLEGE

The first task in selecting the best location for the proposed college involved the identification of alternative locations. The campuses in New England and New Jersey which were considered to provide the most advantageous environment for a college of veterinary medicine were (1) those which have a medical school and/or (2) those which have a college of agriculture.

The data collected included statements of institutional interest, college bulletins, returned questionnaires, and site visit information as well as maps, information on legislative activity, and demographic and weather data from the U.S. government.

A list of criteria was developed and validated outlining important elements of a desirable location. These criteria were then translated into quantifiable terms, and each campus was assessed as to how well it met the criteria. The site which best met these criteria was selected as the optimal location. A Master Panel composed of distinguished veterinarians representing veterinary medical education and other broad aspects of the profession then reviewed the methodology used in selecting the optimal location, the advantages and disadvantages of each campus, and the feasibility of establishing the proposed college at the recommended site.

COSTS

Two previously tested methods for determining space requirements were used: (1) *University Space Planning* by Bareither and Schillinger and (2) Ohio State University College of Veterinary Medicine Space Planning Factors. The cost per gross square foot was obtained from building construction cost data published by Robert Snow Means for college science, engineering, and laboratory facilities located throughout the U.S. projected to mid-1973. An eight percent escalation factor was then applied to the cost for the year 1973, and cost projections were made for the next five years.

A land survey which showed the number of acres of land utilized by existing veterinary colleges was the basis for determining land specifications for the new college.

The net expenditures approach was used to calculate the operating costs of the proposed college by relating expenditures to faculty. The unit cost was based on the number of faculty engaged in all functions of the college (instruction, patient care, research, planning, and administration). The average annual cost per faculty member was determined for each existing veterinary medical college. The cost at the 75th percentile was used, to which overhead was added. The resultant unit cost was then multiplied by the number of faculty considered essential to provide the interrelated functions of teaching, service, and research.

SOURCES OF NON-STATE APPROPRIATED FUNDS

The procedure used in compiling data on federal funding included visits with officials at the National Institutes of Health and a review of brochures and legislative documents on funding which apply directly to veterinary medicine. First, all current and proposed federal legislative programs presently available for colleges of veterinary medicine were identified. Second, the eligibility requirements for these programs were analyzed. The possibility that some programs may be designed for a regional facility or for a veterinary college that is part of a total medical education facility was considered.

Besides the possibility of federal support, private donors and foundations were considered potential sources of funding for the proposed regional college. A review of registers and directories was conducted to document these sources.

STATE PARTICIPATION

The first task involved in determining equitable state participation was the identification of consortia or regional institutions which have an administrative structure similar to that of the proposed college. The purpose of reviewing the literature relating to consortia was to set parameters for developing equitable formulas. No precedent was found for an interstate collegiate institution in which *both* capital and operating costs are shared by several states. In view of this lack of precedent, formulas for the equitable participation by each of the seven states were generated and evaluated by considering the costs and benefits to the individual states. An investigation and examination of such benefits was made; the multiplier effect of added income was also considered.

The methodology used to establish the basis for capital and operating funding considered state revenue, population, per capita income, and economic benefits. The value of the facilities to be shared at the recommended location was deducted from the costs of a model college of veterinary medicine. A formula for state participation in the remaining capital costs was proposed. A plan for providing annual operational funding at the time four classes are in operation and for supplying funds for one-time initial movable equipment was devised.

A plan for allocating student spaces resulted from the study of data pertinent to student demands for admission and ability of states to share in costs.

3. PROGRAMS FOR FULFILLING REGIONAL NEEDS

THE EDUCATIONAL ENVIRONMENT IN A COLLEGE OF VETERINARY MEDICINE

Higher education is a complex process which includes far more than classroom and laboratory instruction. The veterinary colleges are engaged in a variety of functions and activities which collectively create an "educational environment." Multiple activities of education, research, and service are essential and interrelated ingredients comprising the educational environment. In order for a college of veterinary medicine (CVM) to function effectively, these three inseparable activities must be implemented in the form of organized, flexible programs. Speaking in reference to medical education, but equally true of veterinary medical education, Fein and Weber stated

> Teaching must be accompanied by some (but it is not clear how much) research and some delivery of service. There is evidence that the quality of service is positively correlated with the presence of research and teaching. Research may be improved if assisted in by students and, perhaps, if associated with the delivery of service. The medical school's products are therefore multiple and intertwined; it must produce all if it is to produce one [1, p. 8].

The elements benefit and complement one another, and all are equally necessary, almost inseparable.

The interdependency of teaching, research, and service is reflected in varying ways. Graduate students and residents make indispensable contributions to many phases of the educational, research, and service programs. In addition to rendering a significant proportion of the professional services required by patients, residents generally function as teachers to less experienced interns and veterinary medical students. Graduate students in the basic sciences assist faculty members in their research projects and share a portion of the teaching load. Graduate programs are to the basic science faculty what residency programs are to the clinical faculty.

Research funds provide opportunities for student research on a diversity of problems. The equipment, laboratories, and problems for student laboratory or demonstration work are often the result of research funds. Research funds also provide a greater diversity of elective or required courses for both professional and graduate students. Most important, a school can attract and retain competent faculty only when it provides an environment which encourages the individual teacher to provide advanced training and to do research in his field.

Patient and diagnostic services are vital to the educational process because of the opportunity they provide to the student for firsthand observation. The clinical investigation involved in veterinary medical services is a vital part of the

research program. Figure 3.1 demonstrates the three interrelated functions within a CVM and the opportunities for all three areas to collaborate with the medical school.

The unique laboratory and patient-care activities intrinsic to the education of the D.V.M. make attribution of resources to programs, e.g., education, research, patient care and service, extremely difficult – a judgmental art; even if accounting were simpler, it would be almost meaningless to separate one activity from another because of the extreme interdependency.

In defining the educational environment for the new college, it is assumed that instruction alone is not education and that some research and service activities will occur simultaneously with those activities traditionally labeled as educational. This overall educational environment should be constantly in view when reviewing the following sections dealing with each of the individual activities.

EDUCATIONAL PROGRAMS

Program Leading to the Doctor of Veterinary Medicine Degree

Design of the curriculum for the CVM is the responsibility of its faculty; therefore, this feasibility study is limited only to an identification of the trends in veterinary education which influence the location of the college; the number of faculty, students and staff; and the costs of the proposed college.

Colleges of veterinary medicine are charged with the responsibility of instituting educational programs designed to produce competent veterinarians. There are approximately 6,243 professional students in the United States and Canada today [2, p. 8]. A professional student is one enrolled in the college of veterinary medicine in a program leading to the doctor of veterinary medicine degree (D.V.M. or V.M.D.). The twenty-one veterinary colleges in which these students are enrolled have attempted to meet their responsibility by enabling the student to acquire a basic foundation of veterinary medical knowledge and skills and by requiring formal course work in the interrelated pre-clinical and clinical sciences.

The reinforcement and application of the basic principles of the veterinary medical sciences require a wide variety of patients representing many species with the maximum number of diseases. Instruction utilizing patients in the university animal hospital and supplemented by elective instruction at off-campus or satellite facilities enables the student to gain a comprehensive knowledge of veterinary medicine as well as the specialized skills utilized in his profession. Examples of satellite facilities offering opportunities for cooperative interchange involving instruction, research, and service are the New England Regional Primate Research Center, Angell Memorial Animal Hospital, New Jersey Animal Health Laboratory, and Northeastern Research Center for Wildlife Diseases.

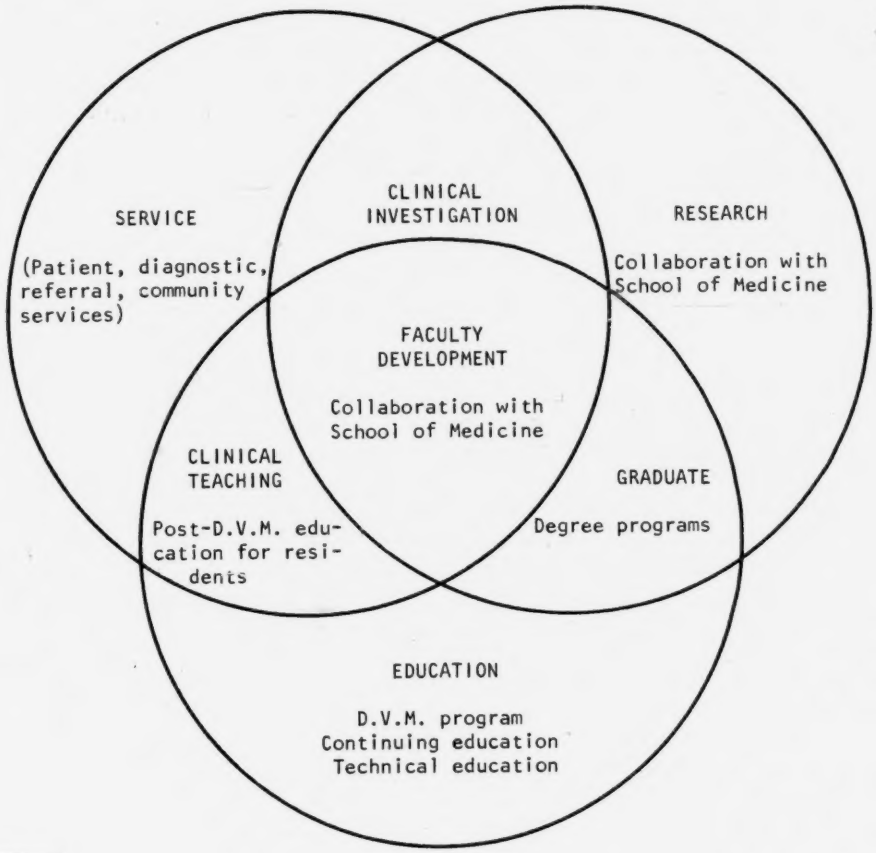

FIGURE 3.1 Interrelated Activities of a College of Veterinary Medicine

Opportunities for supplemental clinical training and experience are provided by private practitioners during the students' vacation periods. This informal experience, called a preceptorship is defined as an organized and voluntary program of practical training and experience sanctioned by the college and pursued before receiving the doctor of veterinary medicine degree. It is not a substitute, however, for rigorous clinical instruction in the university veterinary hospital. Auburn University is the only institution requiring a preceptorship before granting the D.V.M. degree.

Veterinary medicine, like human medicine, has been affected in recent years by advances in educational theory and methodology. Ohio State University in 1969 and Purdue University in 1971, for example, initiated the core-elective approach, allowing students to choose the courses in which they are interested as a part of completing the professional degree requirements. More emphasis is being placed on utilizing an interdisciplinary approach to teaching through team teaching and an organ systems approach.

An important part of veterinary medical education is teaching the student to use existing learning materials independently, enabling him to keep abreast of new developments in veterinary medicine long after his D.V.M. degree has been awarded. One effective method of independent learning and the acquisition of self-teaching skills is the utilization of a learning resources center. A learning resources center provides both materials and specially designed facilities useful in the attainment of learning goals. Some elements of an effective learning resources center are an autotutorial laboratory with learning carrels, computer assisted-learning areas, television-viewing areas and conference-office areas; an audiovisual room for instruction of large classes; and facilities for medical photography, illustration, and closed circuit television production. All of these facilities, operated in conjunction with the veterinary medicine library, complete a total learning resources center.

There is little if any evaluative data on the cost involved in implementing these innovative programs. In regard to technology-based instructional media, the Carnegie Commission on Higher Education recently published a study which indicated that the new technologies as they apply to university-level instruction are advancing much more slowly and costing more than was expected. They also seem to be adding to, rather than replacing, more traditional approaches [3]. Congress, recognizing the need for evaluative data, has requested the National Academy of Sciences to conduct a study of the cost of educating students in the health professions [4]. There seems to be an effort toward instituting educational research and development units in colleges of human medicine and to a lesser extent in other schools of the health professions, staffed with people having expertise in educational psychology, evaluation and measurement of learning, and cost analysis [5].

The expense for personnel would appear to be much higher in programs having multiple sections of classes with low enrollment. Formerly one professor taught a single course; now, four to eight faculty members may be involved in teaching a single course using the team-teaching method. In the core-elective

approach, there are many organizational problems affecting cost. Where a course formerly was offered once a year with 60-128 students enrolled, it may now be repeated as an elective each quarter to many small groups of 6 to 20 students. It is conceivable that teaching costs in such programs are considerably higher than in the lecture-laboratory approaches.

Integration of disciplines in the preclinical and clinical sciences and the utilization of patients during all four academic years, a trend for many years in human medicine, is being imitated by several colleges of veterinary medicine. The organ systems approach is extremely autonomous and poses insurmountable problems for a CVM which attempts to utilize existing courses in a college of medicine and other colleges in the university. For example, courses such as physiology and biochemistry could serve both medical and veterinary medical students if they are presented as courses in a discipline rather than in courses integrated with psychiatry and other human clinical sciences.

Selection and development of the curriculum, whether lecture-laboratory, core-elective, specialty tracks, independent learning, or a combination of these, is the responsibility of the faculty; the result will be an educational program involving (for example) the following areas in comparative medicine:

- cell biology
- anatomy
- biochemistry
- physiology
- pharmacology
- parasitology
- microbiology
- pathology
- preventive medicine
- epidemiology and public health
- medical genetics
- nutrition
- computer science
- environmental medicine
- surgery and orthopedics
- radiology
- internal medicine
- bionomics and ethology
- laboratory animal medicine
- theriogenology
- ophthalmology
- anesthesiology
- neurology and behavior
- cardiology
- endocrinology
- gastroenterology
- urology
- dermatology
- aquatic medicine
- toxicology
- clerkships in urban medicine, equine medicine and food animal medicine
- ethics, personnel and business management

On January 1, 1970, there were 904 or 69.3 percent of the veterinarians in the seven states self-employed or otherwise involved in private practice [6, p. 58], while 401 or 30.7 percent of the veterinarians in the region (whose field is known) were employed professionally in fields such as the pharmaceutical industry, medical schools, and state and federal agencies [6, p. 58]. Thus, it appears that the new college should serve the special needs of the region by designing educational programs with elective tracks which include the fields represented by 30.7 percent of the veterinarians.

Veterinary medical education responded to the emergency need for veterinarians during World War II by initiating accelerated 12-month programs. Problems such as student and faculty fatigue, deterioration in the quality of instruction, shortage of qualified faculty, inadequate clinical experience, and curriculum synchronization caused the colleges to return to the traditional academic year. Initial curriculum planning should be based upon the traditional academic year, subject to modification by the faculty after the college is well established.

This study (1) RECOMMENDS that the proposed college of veterinary medicine strive for flexibility in structuring its educational program in a manner which will utilize existing courses and facilities in a medical school and also enhance the development of comparative medicine and the study of animal models of human diseases in a health center. The faculty should have the opportunity to choose elements from the lecture-laboratory, independent-learning, and core-elective approaches and to weigh cost-benefits and educational merit as important selection criteria.

The study further (2) RECOMMENDS that an elective program, or tracks, be established which will enhance the D.V.M. degree program by offering the student a wide range of intramural and extramural opportunities for concentrated study in areas of his interest and consistent with the needs and resources of the seven-state region. Electives may allow the student to study a variety of topics at renowned medical schools and other institutions in the region such as the New England Regional Primate Research Center, Angell Memorial Animal Hospital, New Jersey Animal Health Laboratory, Massachusetts Institute of Technology, and marine and industrial laboratories.

Post-D.V.M. Education

Post-D.V.M. education is education in veterinary medicine beyond the first professional degree (D.V.M. or V.M.D.). Such education may include internships and residencies and work toward master's and Ph.D. degrees but excludes continuing education.

Internship. An internship, a supervised program of advanced instruction in the veterinary medical specialties usually of one or two years duration, provides the individual with the opportunity to apply the principles he has learned during the formal portion of his D.V.M. program. In addition, the intern may be able to take advanced course work in the basic or clinical sciences to extend his previous knowledge in these disciplines.

There are ten veterinary colleges in the United States and Canada conducting internship programs for 77 interns [2]. In addition, in the New England area, both Angell Memorial Hospital in Boston, Massachusetts, and Rowley Memorial Hospital in Springfield, Massachusetts, offer intership programs. Even with these valuable intership programs, the number of applicants is far greater than the number of spaces.

Residencies. A residency, being somewhat longer than an internship program, enables individuals to acquire exceptional proficiency in a discipline or medical specialty. There are eight veterinary colleges in the United States and Canada offering residencies for 45 residents [2]. Residency programs are designed to prepare veterinarians for examination and certification by a specialty board, recognized by the American Veterinary Medical Association. Such specialties reflect both societal and professional needs (e.g., pathology, public health, laboratory animal medicine, radiology, toxicology, surgery, ophthalmology, internal medicine, microbiology, theriogenology). The number of applicants for residency programs far exceeds the number of spaces available. There are few formal residency programs in existing CVM's offering training in many of the emerging fields, such as environmental health and aquatic and zoo animal medicine.

Advanced Degrees. In the twenty U.S. and Canadian colleges of veterinary medicine reporting, there was a total of 619 M.S. students and 573 Ph.D. students (or a mean of 59.6 advanced-degree candidates per college) [2]. Veterinarians with advanced education in all fields of specialization are necessary to provide specialists for practice, research, and teaching positions. The establishment of a flexible graduate program in the new college should complement existing programs in the seven states by concentrating on programs which are not currently offered. Graduate programs related to veterinary medicine and currently offered by universities in the seven states are listed in Table 3.1. While all of these programs serve specific professional areas, they by

TABLE 3.1 Existing Advanced Degree Programs Related to Veterinary Medicine Located in the Seven-State Region

University	*Degree Offered*	*Major*	*Specialty Areas*
Connecticut	M.S. and Ph.D.	animal diseases animal genetics	pathogenic bacteriology, biochemistry of disease, comparative pathology, comparative virology
Maine	M.S. Ph.D.	animal science animal nutrition	animal nutrition animal physiology
Massachusetts	M.S. and Ph.D.	animal sciences wildlife	mammalian and avian biology
	Ph.D.	wildlife or fisheries biology	options: genetics, physiology, nutrition, animal diseases
Rhode Island	M.S. and Ph.D.	animal pathology	
Rutgers	M.S. and Ph.D.	animal science	animal breeding, animal genetics, animal physiology, animal nutrition, animal pathology
Vermont	M.S.	animal pathology	

no means encompass all of the fields of comparative medicine, such as bio-engineering, toxicology, aquatic animal medicine, epidemiology, and public health in which an advanced degree should be available.

This study (3) RECOMMENDS that the new college implement a flexible internship program as a part of the post-D.V.M. education offerings.

The study further (4) RECOMMENDS that the new college establish residency programs in fields in which specialty boards are recognized by the AVMA.

The study also (5) RECOMMENDS that the new college establish flexible graduate programs (a) complementing the M.S. and Ph.D. programs currently in the seven-state region, and (b) primarily emphasizing advanced degree programs in areas which do not have residency education leading to certification by a specialty board recognized by the AVMA.

Continuing Education

The purpose of continuing education is to enhance the professional competence of veterinarians and thus improve the quality and delivery of veterinary medical services. Continuing education may be defined as programs of study designed to provide veterinarians with specialized training as a supplement or refresher to their previous education. Such education varies from independent study to formal courses of instruction.

The proposed college of veterinary medicine should provide for a process of need assessment, program development, presentation, and evaluation of continuing education for veterinarians. Facilities and personnel required for the other educational and research programs of the school may also serve programs of continuing education. An effective continuing education program may be largely self-sustaining. It should be possible for the school to be reimbursed for the direct cost of specific programs exclusive of fixed costs such as space and salaries.

The continuing education needs of the practitioners within the New England-New Jersey region should not be determined unilaterally by a faculty committee within the institution. Rather, a system must be established to provide a realistic assessment of the topics to be included in the programs taking into account both short- and long-range goals. The possible emergence of mandatory continuing education may cause significant changes in audience makeup, subject matter, and goals. Veterinary associations and academies are taking steps to encourage continuing education.

This need assessment system should include a demographic profile of all veterinarians within the seven-state region (numbers, types of practices, location, and distribution); a profile of all agencies, associations, and institutions within the seven-state region, such as the New England Veterinary Medical Association, which provide continuing education opportunities for veterinarians; and the

development of a mechanism for assessing the educational needs directly from the veterinarians being served as well as for determining later if these identified needs have, in fact, been met.

The development of a high-quality continuing education experience for the practicing veterinarian requires a systematic approach, which can generally be divided into five steps.

1. Determine the veterinarians' educational needs and enlist their aid in planning.
2. Formulate clear learning objectives in behavior terms.
3. Identify available program resources and their limits.
4. Develop program design and select methods to accomplish the objectives.
5. Develop and implement an adequate system of evaluation [7, pp. 642-44].

In the light of the expanding roles that veterinarians undertake, the new college of veterinary medicine should assist the practitioner in adjusting to new demands as well as help him to qualify to assume new duties and increased responsibilities.

This study (6) RECOMMENDS that the college, in cooperation with veterinary medical associations in each participating state, develop a broad spectrum of programs needed by practicing veterinarians in the seven-state area. Adequate support services should be provided by the college.

Animal Technician Programs

A technical student is one who is enrolled in a certificate or degree-granting program of two to four years duration leading to qualification as a animal technician or veterinarian's assistant. The AVMA Executive Board's Advisory Committee on Animal Technicians defines an animal technician as

> a person knowledgeable in the care and handling of animals, in the basic principles of normal and abnormal life processes, and in routine laboratory and clinical procedures. He is primarily an assistant to veterinarians, biological research workers, and other scientists [8, p. 396].

The education of such personnel is not well defined. *New Horizons for Veterinary Medicine* states that "there is no accrediting body to approve training programs and, except for a group that certifies competency of laboratory animal technicians, certification is not available" [9, pp. 126-127]. Education programs for technicians are as varied as the duties of such technicians. In the New

England and New Jersey region, the following educational institutions offer programs for animal technicians:

TABLE 3.2 Institutions in New England and New Jersey Offering Educational Programs for Animal Technicians

College and Location	*Degree and Length of Program*
CONNECTICUT:	
Quinnipiac College Hamden, Connecticut	Bachelor of Science 4 Years
MAINE:	
University of Maine Department of Animal and Veterinary Sciences Orono, Maine	Associate of Science 2 Years
MASSACHUSETTS:	
University of Massachusetts Department of Veterinary and Animal Science Stockbridge School of Agriculture Amherst, Massachusetts	Associate of Science 2 Years
NEW JERSEY:	
Camden County College Blackwood, New Jersey	Associate of Science 2 Years
VERMONT:	
University of Vermont Department of Animal Pathology Burlington, Vermont	Bachelor of Science 4 Years

The AVMA Advisory Committee on Animal Technicians suggests these general considerations for institutions offering animal techinician programs:

1. Programs should be established in institutions of higher learning that are accredited by a regional accreditation agency recognized by the National Commission on Accreditation.
2. Physical facilities should be adequate and modern; live animals of various species should be available and used in teaching.
3. Admission requirements should include high school graduation or its equivalent and desirable personality characteristics.
4. It is highly desirable that a doctor of veterinary medicine be employed as the administrative director of the program; full-time faculty should include such doctors also.
5. Actual experience with live animals and on-the-job training should be integral parts of the program.

6. The curriculum should be a two-year course and should include general and specific course material [8, p. 397].

The AVMA Committee on Accreditation of Training for Animal Technicians (hereafter referred to as CATAT) proposes generally the same guidelines but in addition (1) defines the curriculum more specifically as to content of program and (2) requests that a system be established to evaluate the activities of the graduates.

The AVMA has not approved, evaluated, or accredited any of the various programs for animal technicians. However, R. Leland West, D.V.M., Assistant Director of Scientific Activities, AVMA, states that in 1973 the AVMA is undertaking this responsibility, as well as making recommendations regarding registration, in 1973 [10].

The CATAT has under consideration a proposed program for accrediting educational programs for animal technicians. Basically, the proposal provides for accreditation by the following methods:

1. Accreditation of the parent school by the regional accrediting agency which is recognized by the National Commission on Accrediting and the U.S. Office of Education.
2. The report by the state advisory committee that is recognized by the state veterinary medical association.
3. A review of the curriculum.
4. A site visit by a committee of the CATAT [11].

One of the major weaknesses in the program of instruction in colleges of veterinary medicine listed in *New Horizons for Veterinary Medicine* is "Failure to train professional students to recognize the value of, and to use properly, veterinary paramedical personnel" [9, p. 92].

Education of animal technicians in the teaching hospital of the college of veterinary medicine should provide greater assurance that (1) veterinarians will recognize the potential of and effectively utilize technicians, (2) technicians are cognizant of the professional limitations inherent in their occupation, and (3) these two types of health-care personnel taught as a team will learn to work as a team.

This study (7) RECOMMENDS that, after the D.V.M. program is well established, development of ways to enhance animal technician programs in existing institutions of the region will have educational merit. The same space, equipment, and animal resources provided for the D.V.M. program could be utilized by such a technician training program; the students in animal technology, for example, might complete the first year in one of the existing schools in the seven-state region followed by part or all of the second year in the teaching hospital of the college of veterinary medicine. The college of veterinary medicine, however, should *not* initiate a new animal technician program.

RESEARCH PROGRAM

Research must be an integral part of any college of veterinary medicine in order for the college to meet fully its responsibility to society. Besides fulfilling a societal need, an effective research program at a college of veterinary medicine attracts well-qualified faculty and students and is, in fact, necessary for the development of both.

Veterinary research is a widespread and diverse activity, being conducted in many laboratories and colleges across the United States. It can be broken down into six categories: (1) research related to food-producing animals and horses; (2) research contributing to advances in biology and medical science, including research on diseases transmissible from animals to man and animal models of human diseases; (3) research on companion animals; (4) research on other animals such as wild, zoo, fur-bearing, and marine; (5) research on laboratory animals; and (6) research in comparative medicine [9, p. 49].

Because of the costs involved, any one institution would be unable to support extensive research in all of the six areas outlined above. A new college should collaborate with the world-renowned medical institutions in the region and emphasize research in those areas which would be of greatest benefit in meeting the needs of the New England-New Jersey region. It will be unique in that (a) it will be the only college of veterinary medicine serving the research needs of seven states, and (b) research will be enhanced by collaboration with internationally prominent biomedical scientists in the region. Important problems for investigation include viral diseases in Vermont's large dairy herds [12, p. 1]; coccidiosis of poultry in both Vermont [13] and Connecticut [14]; and Eastern encephalitis, swamp fever, and endoparasitism, all of concern to horse breeders of Connecticut [15]. Since the horse industry is becoming a large business in New England and New Jersey (equine population in the New Jersey area almost doubled in the last twelve years) [16], a new school should consider research on equine diseases. Finally, the new college, serving states bordering on the Atlantic Ocean, also has a high potential for developing an extensive research program in marine and aquatic animal diseases.

This study (8) RECOMMENDS that the proposed college (a) institute a research program in collaboration with the other medical and biomedical teaching and research institutions in the region, and (b) retain flexibility to meet the unique needs of the seven-state region.

PROGRAM EVALUATION

The trend to examine the effectiveness of programs and the stress on accountability are promulgated by state governments in response to rapid changes that are taking place in all areas of instruction, including veterinary medical education.

This study (9) RECOMMENDS that the college should engage in continuous evaluation of the quality and economy of its programs to maintain dynamic response to societal demands and available resources.

REFERENCES

1. Fein, Rashi and Gerald I. Weber, *Financial Distress Study Report,* U.S. Department of Health, Education and Welfare, December, 1971. As quoted in "Medical Education in the United States 1969-1970," *Journal of the American Medical Association,* Vol. 210, Nov. 24, 1969, p. 1477.

2. Association of the American Veterinary Medical Colleges, *Comparative Data Summary, 1972-73 Academic Year, Veterinary Medical Schools and Colleges,* January 29, 1973. (Privileged information, courtesy of the Association.)

3. Carnegie Commission on Higher Education, *The Fourth Revolution: Instructional Technology in Higher Education,* New York, McGraw-Hill, 1972.

4. Public Law 92-157, 92nd Congress; H.R. 8629, November 18, 1971.

5. The Association of American Veterinary Medical Colleges Meeting, *Proceedings Curriculum,* New Orleans, July, 1972.

6. New England Board of Higher Education, *The Need for a College of Veterinary Medicine to Serve New England and New Jersey,* Wellesley, Massachusetts, 1973.

7. Future Planning Committee of the Section of Teachers of Continuing Education of the American Association of Colleges of Pharmacy, "Guidelines for Continuing Pharmaceutical Education," *American Journal of Pharmaceutical Education,* XXXVI (Nov., 1972), pp. 634-647.

8. "Animal Technicians," *Journal of the American Veterinary Medical Association,* Vol. 156, No. 4 (February 15, 1970), pp. 396-398.

9. National Academy of Sciences, *New Horizons for Veterinary Medicine,* Washington, D.C., 1972.

10. West, Leland, D.V.M., Assistant Director of Scientific Activities, American Veterinary Medical Association, Personal Communication, January, 1973.

11. AVMA Committee on Accreditation of Training for Animal Technicians (CATAT), "Essentials of an Acceptable Program for Training Animal Technicians," CATAT-6, AVMA Mimeograph.

12. Department of Animal Pathology, *Animal and Poultry Disease Diagnoses, 1971,* University of Vermont and State Agricultural College, Burlington, Vermont, 1971.

13. Bolton, W. D., D.V.M., Professor and Head, Department of Animal Pathology, University of Vermont, Personal Communication, Feb. 5,1973.

14. Department of Pathology, *Annual Report, 1971-1972,* University of Connecticut, Storrs, Connecticut.

15. Van Kruiningen, H. J., D.V.M., Ph.D., Department of Pathobiology, College of Agriculture and Natural Resources, University of Connecticut, Storrs, Connecticut, Personal Communication, Jan. 30, 1973.

16. Jewell, C. K., D.V.M., Director, Division of Animal Health, Department of Agriculture, State of New Jersey, Trenton, New Jersey, Personal Communication, Jan. 16, 1973.

4. SIZE AND ORGANIZATION OF THE PROPOSED COLLEGE

Size is used to denote the number and magnitude of programs and services, the number of people involved, and finally the actual space required to accommodate both programs and people. The size of an institution is influenced by many factors, including (1) the demand for its graduates, (2) the number of students wishing to enroll, (3) the number and quality of the programs of instruction, (4) research programs, (5) professional and community services, and (6) the number of faculty and staff.

The mix of different levels of students in a college of veterinary medicine is an important factor in planning. In the United States and Canada for the academic year 1972-73, there were 6,243 students in the doctor of veterinary medicine degree (D.V.M.) program; 1,441 interns, residents, and graduate students; 10,642 registrants in continuing education; and an unknown number of students in the non-veterinary undergraduate and technician programs. Table 4.1 indicates that in 1972 the mean number of all classifications of students for existing veterinary colleges was 873, and the mean number of veterinary students was 297 [1].

The table outlines both faculty and student FTE's (full-time equivalents). FTE faculty is the term used to denote the full- and part-time faculty of an institution on a full-time basis. For example, four faculty members engaged 25 percent of their time are considered one full-time equivalent faculty member. One FTE student is the usual prescribed number of semester or quarter hours of study a full-time student assumes. For example, if the prescribed number of quarter hours of study is 15 and a student assumes a total of 10 quarter hours, he is a .67 FTE student.

DEMAND FOR GRADUATES AND CONTINUING EDUCATION

Veterinary colleges have students in the following classifications: professional, continuing education, interns, residents, graduate, undergraduate, and technical. The study published by the New England Board of Higher Education (NEBHE) in 1973 identified the magnitude of need for veterinarians [2]; however, the need for education beyond the first professional degree (post-D.V.M. education) is equally significant. For example, a growth rate of five percent a year from 1970 to 1975 and ten percent a year from 1976 to 1980 is the predicted need for veterinarians certified in the specialty of laboratory animal medicine [3, p. 28]. The recognized need for veterinary specialists suggests that the new college should plan for an enrollment of 100 (50 FTE) veterinarians, physicians, and other health professionals in residency and graduate education. The annual need for technical graduates is estimated at twenty initially with increases, based

upon the number actually employed by veterinarians in the region, to thirty in future years.

Ideally, all veterinarians might participate annually in selected continuing education courses. Table 4.1 indicates a mean of 591 attendees in continuing education for the eleven veterinary colleges reporting; therefore, it is estimated that initially 600 of the 1,587 veterinarians in the seven-state region [2, p. 29] may enroll annually in one or more continuing education programs of the new college. This number will escalate if one or more of the states require health professionals to annually participate in continuing education, a trend that is gaining momentum.

TABLE 4.1 Number of Students and Faculty in the U.S. and Canadian Colleges of Veterinary Medicine in 1972-73

Students and Faculty	*No. of Colleges Reporting*	*Mean*	*Median*	*75th Percentile*
Students:				
D.V.M. (FTE)	21	297	301	343
M.S.	20	31	22	35
Ph.D.	17	34	23	38
Residents	8	6	4	9
Interns	10	8	5	12
Total Post D.V.M.*	20	72	50	89
Continuing Education	11	591	392	698
Total Students**	21	873	761	1022
Faculty FTE:***				
Senior Faculty (Dept. Heads, Prof., Assoc. Prof., Asst. Prof.)	21	74	67	87
Junior Faculty (Instr., Asst. Instr., Residents, Interns, and Others)	21	37	36	47
Total Faculty	21	111	110	122

*Includes M.S., Ph.D., Interns, Residents, Non-degree Registered, Post-Doctoral and Other.

**Does not include technical students and other undergraduates.

***Full-time equivalent D.V.M., M.D., Ph.D., or equivalent professionals engaged in teaching, research, and service.

NUMBER OF VETERINARY STUDENTS WISHING TO ENROLL

Pressure from the number of well-qualified students wishing to enroll is the second factor influencing the size of a college. Because most of the pre-veterinary medical students in each state are probably enrolled in the larger state

universities, the data presented in Table 4.2 list enrollment figures for the large state universities from which data were available.

TABLE 4.2 Pre-Veterinary Medical Student Enrollment for the Seven-State Universities 1971-72, 1972-73, and Expected Enrollment 1978*

University	*1971-72 Enrollment*	*1972-73 Enrollment*	*Expected Enrollment 1978*
Connecticut	60	75	85
Maine	39	36	40
Massachusetts	89	182	300
New Hampshire	80	138	200
Rhode Island	30	35	50
Rutgers	150	175	185
Vermont	76	80	—
Total	524	721	860

*Questionnaires mailed to state universities and personal communication with professors of veterinary science at state universities.

These figures include students enrolled in all four years of the pre-veterinary medical program. In any one year the number of students actually completing the pre-veterinary baccalaureate program, and therefore considered as potential applicants to the college of veterinary medicine (CVM), would be considerably less than one-fourth of the total enrolled.

Not all pre-veterinary medical students apply for admission to a veterinary college. Because many choose another related field, the above figures may not portray accurately the number of students who actually apply to a college of veterinary medicine. A more accurate measure is the number of students from each state who in fact apply to a college of veterinary medicine. Since most New England and New Jersey residents who apply to a veterinary college apply to both the University of Pennsylvania and Cornell University, the number of applicants from the region to the University of Pennsylvania School of Veterinary Medicine is used as a measure of students who would actually apply to a college of veterinary medicine.

As shown in Table 4.3, there were 210 students from New England and New Jersey who applied to the University of Pennsylvania School of Veterinary Medicine in 1972. This number probably represents a conservative estimate of the total New England-New Jersey students who apply annually to a college of veterinary medicine.

California with a population of 19,953,134 in 1970 had 84 residents who were admitted to a U.S. veterinary college in 1970-1971. During the same period, 55 residents from among 18,241,266 people in New York, ranking second in population, were admitted to a U.S. veterinary college [2, p. 32]. New England and New Jersey in 1970 have a combined population of 19,015,350; thus it

TABLE 4.3 Student Applications to the University of Pennsylvania School of Veterinary Medicine from the Seven-State Region*

	1971	*1972*
Connecticut	23	36
Maine	4	7
Massachusetts	42	45
New Hampshire	9	7
New Jersey	73	98**
Rhode Island	4	10
Vermont	2	7
Total	157	210

**The Need for a College of Veterinary Medicine to Serve New England and New Jersey,* 1973, p. 37.

**Approximately 50 other N.J. residents applied to some other school of veterinary medicine in 1972.

appears that the new college should be planned to accommodate at least 80 entering professional students [2, p. 32].

For the academic year 1972-73, existing colleges of veterinary medicine in the United States have individual first-year D.V.M. enrollments ranging from 45 to 130 [1, p. 8], with a mean entering class size of 87. New colleges of veterinary medicine are projecting entering classes of professional students as follows: (1) Louisiana State University, Baton Rouge, 32 with expansion to 96 students; (2) University of Florida, Gainesville, 80 students.

In view of the preceding considerations for establishing the class size for the new college, facilities should be constructed for 384 professional students (four classes of 96 each) to allow for the desired expansion. In light of (a) the small faculty manpower pool, (b) the difficulty in recruiting qualified faculty, and (c) the heavy demand upon faculty to plan and develop curriculum, course syllabi, learning resources, and a clinical program, it is prudent to open the college with an initial class of 64 professional students and after the end of the fourth year of operation expand to a class size of 96 as rapidly as qualified faculty can be recruited.

Effect of Federal Programs on Out-of-State Students

The majority of the students in the existing colleges of veterinary medicine are residents of the state in which the college is located. Currently there are only 54 residents of the seven states enrolled in the 1972-73 first-year entering class of the existing colleges of veterinary medicine in the United States [2, p. 32].

The U.S. colleges of veterinary medicine, except for two, have participated in the federal programs under the Comprehensive Health Manpower Training Act of 1971, which provides capitation grants. Each of the colleges that participated in the program received federal funds for each full-time veterinary medical

student enrolled. The president's budget, prepared in January, 1973, failed to provide for continuation of the capitation grants to colleges of veterinary medicine after July 1, 1974. If this decision prevails, the colleges of veterinary medicine may be forced to reduce their enrollments which expanded rapidly under federal subsidization. Several colleges of veterinary medicine are considering a reduction in their enrollments when the federal capitation grants are discontinued. It is predicted that the reduction in enrollments would to a great extent be a reduction in the admission of out-of-state students. If in the years ahead colleges permit themselves to become heavily dependent upon federal aid, the federal government may be in a position to control the quality, scope and magnitude of education by withholding such aid.

The seven states, therefore, should plan for no greater and possibly lesser success in enrolling students in existing colleges of veterinary medicine. It follows that the proposed college must be of sufficient size to accommodate many of the residents of the seven states who will be applying but probably will be refused admission to the existing colleges if federal capitation grants are not reinstated after 1974.

PROGRAMS OF INSTRUCTION

The proposed college should be of sufficient size and coverage in the spectrum of programs which it offers, not only to provide high-quality programs of education for its students but also to excel in research and service. Its program should be commensurate in quality with those in the internationally renowned medical schools in the New England and New Jersey region. The quality and size of the educational programs (including professional, post-graduate, and continuing education) depends on the availability of adequate numbers of faculty specialists representing all facets of the veterinary medical profession.

All programs of instruction and research require a comprehensive library. Existing veterinary medical libraries average 17,900 bound volumes and 500 current serial subscriptions [3, p. 108]. Allowance for technological advances and use of varied learning media in the library leads to the recommendation that the library should be designed as part of a learning resources center and should be planned for 30,000 volumes plus a varied learning media area equivalent to space for 15,000 volumes.

RESEARCH PROGRAMS

Sophisticated research currently requires highly specialized investigators working as a team. If the required number of faculty specialists are available for the educational and service programs, the college will have qualified investigators to pursue important research problems in traditional areas as well as in emerging fields such as comparative medicine, environmental health, consumer protection, and diseases of aquatic animals.

PROFESSIONAL AND COMMUNITY SERVICES

The university veterinary hospital must be staffed by a wide spectrum of veterinary medical specialists to provide effectively the most advanced patient care and a competent referral and diagnostic service in addition to instruction and research. It is also essential to have sufficient numbers of animal patients for instruction. Patients should represent the widest possible spectrum of species and the maximum number of diseases.

Provision of adequate instruction according to the experience of existing colleges requires that the veterinary teaching hospital be designed to accommodate at least eight small animal patients, one equine patient, three mammalian food animal patients, and a total of five laboratory animal, avian, marine, zoo, and wildlife patients per senior veterinary student. While patients are used for instruction of all four classes of veterinary students, the ratio of patients to senior students is used merely for convenience as the unit for calculating the size of the hospital. If the teaching hospital provides high-quality service, it will attract sufficient numbers of patients to serve the educational and research requirements.

The quality of animal health care in the region will be enhanced if the practicing veterinarians have an opportunity to consult with faculty specialists and refer patients to them for specialized diagnostic and therapeutic procedures. The latter activity also promotes regular practitioner-faculty interaction, which is one of the most effective aspects of continuing education.

In addition to patient care and diagnostic service, the faculty renders university-wide and community service by (a) functioning on committees, (b) advising on public health and consumer protection, and (c) providing extension service (adult education) for the people in the region.

NUMBER OF FACULTY

The minimum size of colleges of the health professions is determined by the minimum number of faculty specialists required to (a) teach all of the essential disciplines and specialties (see partial list of professional areas in Chapter 3), (b) teach all levels of students, (c) provide excellent patient care as a model for students, (d) provide a highly competent referral service, (e) conduct a diagnostic laboratory, (f) achieve excellence in research, and (g) be responsive to demands for university-wide and community service.

In 1972-73, there were 2,330 full-time equivalent (FTE) faculty employed in the twenty-one colleges (1), with an arithmetic mean of 111 FTE faculty, as given in Table 4.1. The two most recent colleges of veterinary medicine to be developed and accredited, Purdue University and the University of Saskatchewan, had 121 and 74 FTE faculty, respectively, for the 1972-73 academic year [1].

Determination of the number of faculty and support staff (all non-faculty employees) required for the new college should be done in accordance with the usual standards followed by existing colleges. According to the institutional data, there will be 1114 full- and part-time students enrolled in the proposed CVM. It is estimated that 108 faculty will be required for (a) instruction of all levels of students (veterinary, residents, interns, graduate, continuing education, and technical); (b) research; and (c) professional services (patient care, diagnostic laboratory, extension services, and services to universities and government agencies). Accomplishment of all these functions requires a broad spectrum of faculty specialists plus three staff people (technicians, typists, photographers, medical artists, animal attendants, etc.) per faculty FTE. By the fourth year of operation, when 256 veterinary students (four classes of 64) are enrolled, the minimum number of faculty required is 64 plus 12 department heads, dean, hospital administrator, and directors. Thereafter, expansion to accommodate a total of 1114 students at all levels plus provide all other college functions will require a minimum of 96 faculty plus 12 partially involved in administration.

ORGANIZATION

Chapter 5 will present the advantages of developing schools of medicine and veterinary medicine in close proximity within a health center to promote efficiencies of operation, quality of the programs and cost reductions. Six of the present eighteen U.S. veterinary colleges are located on the same campus as a medical school; one of the new colleges (Florida) is being established on a campus with a school of medicine.

Veterinary college extension services and research on food-producing animals are enhanced by collaboration with a college of agriculture located in the same university. Cooperative extension services and agricultural experiment stations have a long and successful history, providing primary financial support for extension veterinarians and faculty engaged in applied research on food animals and horses.

It is not the purpose of this report to consider details of the organizational structure of the proposed veterinary college. It should be noted that the trend is to de-emphasize compartmentalization and promote interdisciplinary approaches in both education and research. It follows that a minimal administrative structure should be developed while preserving the identity of individual faculty members with their academic disciplines.

Relative to organization, the "Essentials of an Acceptable Veterinary Medical College" states the following:

> A school or college of veterinary medicine should find its most advantageous environment if it is part of an accredited institution of higher learning. In the best interests of both the institution and the veterinary medical school, the latter requires the same recognition and

autonomy as other professional schools. A veterinary medical school may be fully accredited by the Council only when it is operated as a major administrative division of the parent institution and under the direction of a dean who is a veterinarian [4, p. C-76].

Since the college of veterinary medicine should be established as a part of a health center in close association with the school of medicine and functionally related to other colleges within the university, the organization and administration of the proposed college should be parallel to that of the medical school.

RECOMMENDATIONS

This study (10) RECOMMENDS that the proposed college be sufficient in size and coverage to offer high-quality education, research, and service programs commensurate with those programs offered by the renowned medical schools in the New England and New Jersey region.

This study further (11) RECOMMENDS that the college be planned to accommodate 1114 students including 384 veterinary students; 100 residents, interns, and graduate students; 600 part-time continuing education students; and 30 technical students. This study also RECOMMENDS that the college open with an initial class of 64 veterinary students and enlarge to an entering class of 96 students as rapidly as qualified faculty can be recruited.

The study also (12) RECOMMENDS that the veterinary teaching hospital should accommodate at least eight small animal patients, one equine patient, three mammalian food animal patients, and a total of five laboratory animal, avian, marine, zoo, and wildlife patients per senior veterinary student.

This study further (13) RECOMMENDS that the veterinary medical library be a part of a learning resources center and be designed for 30,000 volumes plus a varied learning media area equivalent to space for 15,000 volumes.

This study also (14) RECOMMENDS that, by the fourth year of operation, the minimum number of faculty required be 64 plus 12 department heads, dean, hospital administrator, and directors. Thereafter, expansion to accommodate a total of 1114 students at all levels and to undertake all other college functions will require a minimum of 96 faculty plus 12 faculty/administrators. The requirements for technical, clerical, custodial, and other non-faculty personnel (support staff) should be calculated using a ratio of three staff to one faculty member.

This study also (15) RECOMMENDS that the college of veterinary medicine be developed in a health center in close association with the school of medicine and that functional relationships be developed with other colleges in the university. In accordance with accreditation requirements, the dean of the college of veterinary medicine should appear in the organizational structure of the university at an administrative level parallel to the deans of other colleges of the health professions.

REFERENCES

1. Association of American Veterinary Medical Colleges, *Comparative Data Summary, 1972-73 Academic Year, Veterinary Medical Schools and Colleges,* January 29, 1973 (Privileged information, courtesy of the Association.)

2. New England Board of Higher Education, *The Need for a College of Veterinary Medicine to Serve New England and New Jersey,* Wellesley, Massachusetts, 1973.

3. National Academy of Sciences, *New Horizons for Veterinary Medicine,* Washington, D.C., 1972.

4. American Veterinary Medical Association, *American Veterinary Medical Association Directory, 1972,* Chicago, Illinois.

5. THE OPTIMUM LOCATION FOR THE PROPOSED COLLEGE OF VETERINARY MEDICINE

ALTERNATIVE LOCATIONS

A major recommendation of the 1973 "Need Study" *(The Need for a College of Veterinary Medicine to Serve New England and New Jersey)* was that a feasibility study should determine the optimal location for a proposed college of veterinary medicine. The present colleges of veterinary medicine in the United States and Canada are located on campuses with colleges of medicine and/or agriculture.

There is a definite trend toward establishing colleges of veterinary medicine on campuses having a college of medicine. *New Horizons for Veterinary Medicine* recommends that

> any new colleges of veterinary medicine that are established be located on campuses with medical colleges and that they have a close functional relationship in organizational structure, location, and program. At the same time, these veterinary colleges should maintain strong links with agriculture and biology [1, p. 138].

The "Need Study" for the New England and New Jersey area completed by the New England Board of Higher Education recommends that

> the proposed regional college of veterinary medicine be closely allied with a medical school whose library, research and clinical facilities will be available as a necessary complement to the veterinary medical program [2, p. 4].

There are definite advantages in having veterinary medicine and human medicine located on the same campus. Veterinary medicine can greatly enhance medical research and education through collaboration with human medicine in the areas of comparative medicine, selection and characterization of animal models for human diseases, diseases transmissible from animals to man, and all areas involving animal experimentation.

The two professional colleges also share certain services: computer technology, educational development and evaluation, administration, technology and equipment for continuing education, laboratory animal resources, biotechnology resources such as mass spectrometry, biomedical engineering, high-voltage electron microscopy, nuclear magnetic resonance spectroscopy, and information-handling systems.

The medical library is a valuable asset for the faculty and students of a college of veterinary medicine. A recent survey showed that "an average medical school

library has over 95,000 bound volumes and almost 1900 current serial subscriptions" [3, p. 9]. Colleges of veterinary medicine which have their own library have an average number of 17,900 bound volumes and 500 current serial subscriptions [1, p. 108]), much of which overlaps the medical library collection. The existence of the medical school library on the same campus with veterinary medicine can, therefore, reduce library expenses while greatly enhancing the quality of professional education for the veterinary student through provision of a more comprehensive documentation of the health sciences.

Because of the importance of a close association between the proposed college of veterinary medicine and a medical school, it was deemed essential that the selected location should either (1) be located on a campus with a medical school, or (2) be closely allied with a school of medicine.

Identification of Possible Locations

There are seventeen existing schools of medicine and colleges of agriculture in the seven-state region (New Jersey and the six New England states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont). Table 5.1 identifies these campuses, their classification as medical and/or agricultural, and their interest in having the proposed college.

TABLE 5.1 Interest of Seven-State Area Campuses in Having a College of Veterinary Medicine

Campus	*College of Med. and/or Agr.*	*Expressed Interest*	
		Yes	*No*
1. U. of Connecticut – Farmington	Med.	X	
2. U. of Connecticut – Storrs	Agr.	X	
3. U. of Massachusetts – Amherst	Agr.	X	
4. U. of Massachusetts – Worcester	Med.	X	
5. Rutgers University – New Brunswick	Agr.	X	
6. Rutgers Medical School – Piscataway	Med.	X	
7. Boston University – Boston	Med.		X
8. Brown University – Providence	Med.		X
9. Dartmouth College – Hanover	Med.		X
10. Harvard University – Cambridge	Med.		X
11. U. of Maine – Orono	Agr.		X
12. U. of New Hampshire – Durham	Agr.		X
13. New Jersey Medical School – Newark	Med.		X
14. U. of Rhode Island – Kingston	Agr.		X
15. Tufts University – Medford	Med.		X
16. U. of Vermont – Burlington	Agr. & Med.		X
17. Yale University – New Haven	Med.		X

The Executive Director of the New England Board of Higher Education (NEBHE) communicated with official representatives of the campuses as to their interest. The six private institutions (Boston, Brown, Harvard, Tufts, and Yale

Universities and Dartmouth College) did not express interest in acquiring the proposed college. They responded negatively, either orally or in writing, when questioned as to their interest in obtaining the proposed college. (See Appendix A for letters of no interest.)

The University of Vermont, the only public institution in the seven-state region having both a school of medicine and a college of agriculture located on the same campus, formed a committee concerning veterinary medical education. The report of that committee concluded that Vermont should establish contractual agreements for student spaces in existing veterinary colleges as well as consider participation in a regional college of veterinary medicine (CVM) rather than construct a college of its own [4, pp. 4-5].

Candidate Campuses

The state universities of Maine, New Hampshire, and Rhode Island, although possessing colleges of agriculture, do not have a medical school among their universities and therefore do not have a close association with a school of medicine. The University of Vermont was excluded from further consideration as a possible site because of the university committee report previously discussed. The remaining states of Connecticut, Massachusetts, and New Jersey each have a state-supported school or schools of medicine and a college of agriculture. In these three states, the medical and agricultural campuses expressing interest in obtaining a regional college of veterinary medicine are given in Table 5.2.

TABLE 5.2 Locations of Potential Host Campuses

Campus	*Location*
University of Connecticut School of Medicine	Farmington, Connecticut
University of Massachusetts Medical School	Worcester, Massachusetts
College of Medicine and Dentistry of New Jersey Rutgers Medical School	Piscataway, New Jersey
University of Connecticut College of Agriculture and Natural Resources	Storrs, Connecticut
University of Massachusetts College of Food and Natural Resources	Amherst, Massachusetts
Rutgers University College of Agriculture and Environmental Science	New Brunswick, New Jersey

Rutgers Medical School, one of the potential host campuses shown in Table 5.2, is an independent organization under the central administration of the College of Medicine and Dentistry of New Jersey. The Rutgers University College of Agriculture and Environmental Science is under the central administration of Rutgers University – The State University of New Jersey. It should be noted that the College of Medicine and Dentistry of New Jersey and Rutgers University are not the same institution. The two Connecticut and the two Massachusetts campuses are part of the respective state universities.

Because the schools of medicine and colleges of agriculture are physically separated, each one of the locations was considered as a separate entity and evaluated accordingly; therefore, there are six separate campuses considered as candidates for the proposed college. The map shown in Figure 5.1 gives each of the locations.

REVIEW OF METHODOLOGY

An objective evaluation of potential sites requires that (1) specific criteria be defined to serve as a basis of comparison, (2) quantitative rating scales be developed to juxtapose the criteria and information gathered, (3) necessary information about each site be collected, and finally (4) the results be compiled into a form from which a conclusion can be drawn. The methodology presented in this section describes how these steps were accomplished.

Criteria

In order to recommend the most favorable site for the development of a veterinary college, an objective method for assessing alternative sites was used. Three sets of criteria were developed outlining those elements which (1) any campus should possess in order to incorporate veterinary medicine, (2) a school of medicine should possess in order to incorporate veterinary medicine, and (3) a college of agriculture should possess in order to incorporate veterinary medicine. These criteria are labeled "General Campus Criteria," "School of Medicine Criteria," and "College of Agriculture Criteria," respectively.

The Advisory Council on Veterinary Medicine, a group of distinguished individuals from varied fields of activity in each of the seven states selected to give advice and guidance to this study, reviewed the list of criteria. The Council validated the list for content (i.e., determined whether each criterion was a suitable measure and thus deleted and added criteria) and weighted the final criteria on a 1.0 to 5.0 scale, 1.0 being the least important and 5.0 being the most important. The weights given by individual Advisory Council members were summed for each criterion and divided by the total number evaluating the

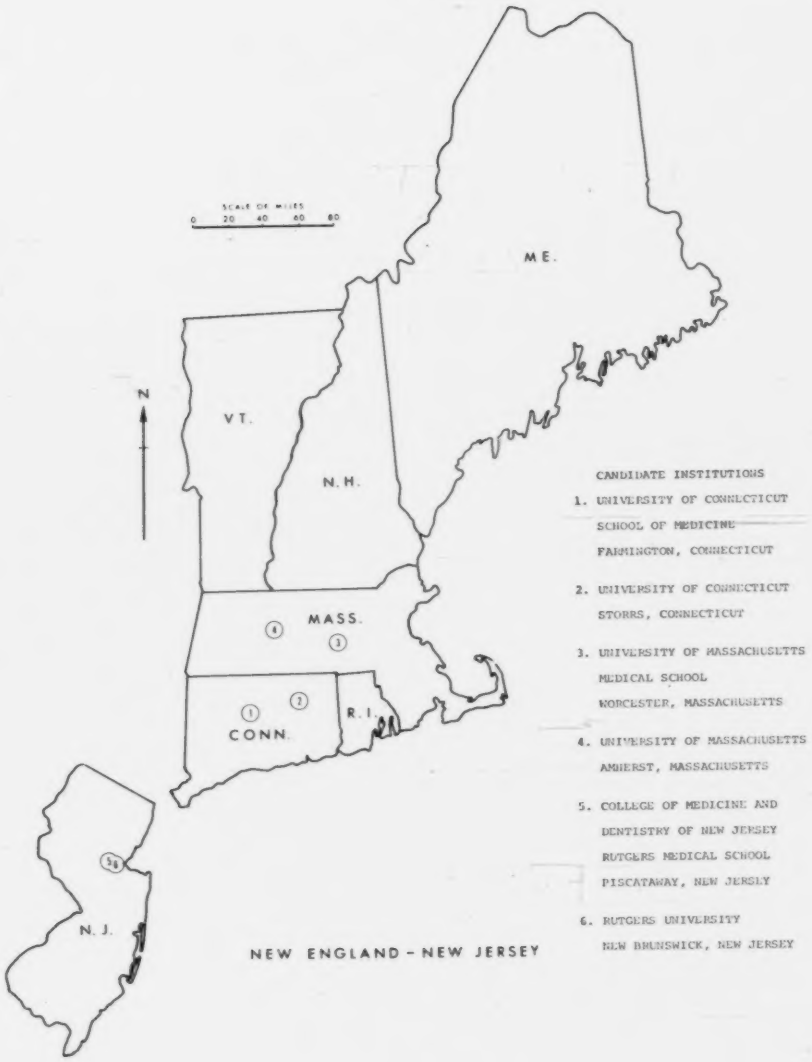

FIGURE 5.1 Candidate Campuses in the New England-New Jersey Region

criterion. The mean weight derived in this manner for each criterion is shown in the following list, which gives the criteria in rank order by category.

General Campus Criteria
(in rank order)

There is legislative climate for support.	4.7
There is support by veterinarians.	4.4
There is an adequate supply of potential companion animal patients.	4.3
The institution is easily accessible to the entire region by air.	4.2
The proposed site is easily accessible by auto.	4.2
There is an existing or proposed and funded medical college on the campus.	4.2
There is an adequate supply of potential food producing and zoo animal patients.	4.1
The institution has demonstrated its interest in having the proposed college.	3.7
There is an adequate supply of university owned land on campus that could be used for a college of veterinary medicine.	3.7
There is an adequate supply of university owned land adjacent to the campus that could be used for a college of veterinary medicine.	3.7
There is an adequate supply of land adjacent to the campus available for purchase that could be used by a veterinary college.	3.7
The veterinary research farm will not be a nuisance to the surrounding area.	3.7
The existing library facilities can accommodate the veterinary medical students and faculty.	3.7
The institution has adequate support services to accommodate veterinary medicine.	3.6
The institution is easily accessible to the entire region.	3.5
There are other satellite facilities which could be used by the veterinary medical students. (For example: New England Primate Center, New England Wildlife Center, Veterans Hospital).	3.4
The general terrain of the area is suitable for the purpose of the new college.	3.2
There is an existing agriculture college on the campus.	2.9

There is a division of allied health sciences on the campus.	2.9
The institution is far enough away from the existing veterinary colleges so that there would be no unnecessary overlap in functions.	2.8
The housing is adequate for supplying the needs of the veterinary student.	2.7
There is a division of public health or equivalent on the campus.	2.6
There is public transportation to and from the proposed site.	2.5
There is a college of pharmacy on the campus.	2.3
There is a college of dental medicine on the campus.	1.7

Criteria for Assessing the School of Medicine

(in rank order)

The research facilities are available for use by the veterinary college.	4.2
The teaching facilities are available for use by the veterinary college.	4.1
There is a medical library with space available for the addition of veterinary medicine.	4.0
There is an effective biomedical research program.	3.9
The medical college has a division of laboratory animal medicine.	3.7
The continuing education facilities are available for use by the veterinary college.	3.7
The clinical facilities are available for use by the veterinary college.	3.3
There are human patients potentially available for veterinary medical student instruction.	2.7

Division of Laboratory Animal Medicine

The division conducts research projects.	3.9
The division offers residency training for veterinarians in laboratory animal medicine.	3.9
There is an animal farm affiliated with the division.	3.9
The division offers a wide range of services.	3.7
The division offers graduate courses leading to a degree.	3.4

The services are available to many different organizations.	3.1
The division offers an animal technician training program.	2.7

Criteria for Assessing the College of Agriculture
(in rank order)

The college has an agricultural experiment station.	4.2
There is an animal research farm affiliated with the university.	3.9
There is an effective biomedical research program.	3.9
The college has a veterinary science department or equivalent.	3.8
The college has a veterinary extension program.	3.8
There is an agricultural library with space available for the addition of veterinary medicine.	3.7
The college has a division of laboratory animal resources to serve the entire university.	3.4
There is a library or portions of a library assigned to veterinary science.	3.3
The college has a continuing education program for veterinarians.	3.3
The college offers an animal technician training program.	2.6

Department of Veterinary Science

The department operates a state diagnostic laboratory.	3.7
There is an effective veterinary research program.	3.7
The department offers a program in preveterinary medicine.	3.4
There is an existing M.S. and Ph.D. program.	3.3
There is an effective extension-diagnostic service program.	3.3
There is an existing Ph.D. program.	3.1
There is an existing M.S. program.	2.9
The department offers a residency program.	2.8
The department offers a residency and internship program.	2.6
The department offers an internship program.	2.2

Rating Scales

After the criteria were validated and the importance established by assigning weights, a numerical rating scale was developed for each criterion so that each potential location for the college of veterinary medicine could be given a meaningful score. The following example shows how a criterion was translated into quantifiable terms:

Criterion	*Rating Scale*		
	1	*2*	*3*
The existing library facilities can accommodate the veterinary medical students and faculty	Low 1-6,000 sq. ft.	Med. 6,001-16,000 sq. ft.	High Over 16,000 sq. ft.

These numerical units, "1," "2," and "3," comprised a rating scale used in determining the degree to which each candidate campus met each criterion. Thus, a campus received a score ranging from 1 to 3 on this criterion, depending upon how many square feet the existing library had available for veterinary medicine. A panel of judges was selected to evaluate the extent to which the scales did in fact and in practice measure a given criterion. This Criteria Rating Scale Validation Panel consisted of four prominent veterinarians (see Acknowledgements) representing veterinary medical practice, public health, education, administration, planning, environmental health, basic and clinical sciences, research, and veterinary college accreditation. Suggestions which this panel made were incorporated in the final rating scales. The resulting scales are found in Appendix B.

Data Compilation

Information needed for assessing alternative sites was identified by the criteria and was collected from a number of sources. References to the specific sources of data are included in the Criteria Rating Scale, Appendix B. A major part of the data was collected from each of the candidate campuses by questionnaires and by site visits.

A series of questionnaires was constructed to determine how well veterinary medicine could be incorporated into the existing academic and physical structure. The questionnaires requested specific information about the general campus as well as information about colleges and schools at the same location which were identified as related to veterinary medicine. These relevant units included schools of medicine, colleges of agriculture, colleges of dentistry, and schools of pharmacy. A copy of the questionnaires can be found in Appendix C. These questionnaires were either mailed directly to the six campuses or delivered personally during meetings in Connecticut, New Jersey, and Massachusetts with

officials from candidate campuses. The questionnaires were also mailed to the Universities of Maine, New Hampshire, Rhode Island, and Vermont. These universities, although not considered candidates, were requested to complete the questionnaires to supply information helpful in forming a more complete picture of the entire region.

A site visit was made to each of the candidate campuses to collect information that was either (1) not complete on the questionnaires or (2) identified as necessary but not amenable to questionnaire form or (3) completed on the questionnaire but in need of validation. Project personnel visiting the campuses and individuals visited at each campus are listed in Appendix D.

During the visit to each campus, the site or sites which the campus proposed for the regional college of veterinary medicine were toured. In addition, the following items were topics of discussion:

1. Review of land usage maps
   a. Topography
   b. Current and proposed construction
   c. Suggested sites for the proposed college
   d. Proximity to a school of medicine
2. Current and projected costs of construction per gross square foot for libraries, classrooms, offices, and laboratories
3. Existing land, facilities, and staff which may serve the proposed college
4. Satellite facilities which may be assets to the proposed college (off-campus institutions, laboratories, and other facilities located near enough that faculty, student, and facility personnel might have cooperative interchange involving instruction, research, and service)
5. Existing educational programs which may serve veterinary medical students.

Special data collection forms were prepared as an aid in gathering information at each site in a systematic manner. Also, a package of questions about missing or unconfirmed data was made for each campus.

The data obtained from all sources including questionnaires and site visits were compiled for each of the six candidate campuses, as given in Appendix E. The data compilation was organized, as were the criteria, into three categories: (1) General Campus Data, (2) School of Medicine Data, and (3) College of Agriculture Data. For each of the three medical school campuses (the University of Connecticut School of Medicine, the University of Massachusetts Medical School, and Rutgers Medical School), there were two types of data compiled: first, the general campus data and second, the school of medicine data. For each college of agriculture campus, there were also two types of data compiled: first, general campus data and second, college of agriculture data. The data compilations match the criteria rating scales in form and content because both are constructed using the criterion as the basic unit.

Data on satellite facilities for each of the three states are presented separately as Appendix F. Potential sites for the regional college are indicated on maps of each candidate campus as shown in Appendix G. In general, the sites selected by campus representatives and personnel on the site visits were based on the availability of sufficient land to satisfy the minimum requirements for a veterinary college; the suitability of the terrain; and the proximity of departments, schools, and colleges on campus which are considered an asset to the veterinary college.

Evaluation of Candidate Campuses

The project staff applied the numerical criteria rating scales (Appendix B) to the data compilations for each campus (Appendix E). An example is given to illustrate the procedure used. For this example criterion, a campus with 19,000 square feet of library space available for veterinary medicine (as shown in the data compilation) received a "high" rating or a numerical value of "3" in the "Rating Received" column. That numerical value is then multiplied by the appropriate weight for this criterion, 3.7, and the product, 11.1, listed in the "Weighted Rating" column.

Criterion	*Rating Scale*			*Rating Received (1, 2, or 3)*	*Weight*	*Weighted Rating (Rating X Weight)*
The existing library facilities can accommodate the veterinary medical students and faculty.	*1* Low 1-6,000 sq. ft.	*2* Med. 6,001-16,000 sq. ft.	*3* High Over 16,000 sq. ft.	3	3.7	11.1

The procedure outlined above was followed by members of the project staff for each criterion. The final rating for each criterion was calculated as the mean of the weighted ratings the criterion received from all evaluators. Appendix E gives the final rating received by each campus on each criterion. The total mean score for a given campus was obtained by summing all of the final ratings for applicable sets of criteria. For a campus having a medical school, the applicable sets of criteria are first the general campus criteria and, second the medical school criteria. Similarly, for a campus having an agricultural college, the applicable sets of criteria are the general campus criteria and the agricultural college criteria.

RESULTS

Evaluation of Candidate Campuses

The objective numerical scores resulting from applying the rating scales to the data compilation for each campus will be discussed here in two separate analyses. Analysis I provides a comparison of the three campuses having medical schools and a comparison of the three campuses having agricultural colleges. In this analysis no attempt is made to compare campuses having medical schools with campuses having agricultural colleges. The general campus criteria relating to the presence of a medical school and an agricultural college (Items 17 and 18 in Appendix E) are therefore deleted. Analysis II is a comparison of the relative merit of all six locations employing a numerical measure of the importance of having a medical school and an agricultural college on the campus.

TABLE 5.3 Results of Campus Evaluations: Mean Scores and Final Rankings (Analysis I)

Campuses with a School of Medicine

Campus	*Rating General Campus Criteria*	*Rating School of Medicine Criteria*	*Total Score*	*Final Rank*
U. of Massachusetts Worcester	197.9	106.7	304.6	1
Rutgers Medical Sch. Piscataway	150.8	92.7	243.5	2
U. of Connecticut Farmington	145.7	92.4	238.1	3
Possible Range	79.3 – 237.9	54.2 – 162.6	133.5 – 400.5	

Campuses with a College of Agriculture

Campus	*Rating General Campus Criteria*	*Rating College of Agriculture Criteria*	*Total Score*	*Final Rank*
U. of Connecticut Storrs	197.7	172.2	369.9	1
U. of Massachusetts Amherst	180.3	135.0	315.3	2
Rutgers University New Brunswick	149.8	119.5	269.3	3
Possible Range	79.3 – 237.9	66.9 – 200.7	146.2 – 438.6	

Analysis I. The "Need Study" recommends that the proposed regional college be closely allied with a medical school [2, p. 4]; *New Horizons for*

Veterinary Medicine recommends that new veterinary colleges be located on campuses with medical colleges [1, p. 138]. In consideration of these two recommendations, it was decided to compare the three locations having medical schools and the three locations having agricultural colleges separately. The mean scores derived from evaluation of the campuses are shown in Table 5.3; first, the scores for the three having medical schools and, second, the scores for the three having agricultural colleges.

Of the three campuses having medical schools, the University of Massachusetts at Worcester received the highest total mean score of 304.6 and a final ranking of "1." Rutgers Medical School received the second highest total mean score; however, there are only 5.4 points separating Rutgers Medical School and the University of Connecticut School of Medicine. This indicates that the campus of the University of Massachusetts Medical School is more clearly differentiated from the campuses of the other two medical schools on the basis of the criteria and can be given a ranking of "1." The ranking of "2" and "3" for the other two campuses appears to be almost interchangeable because of the small difference in numerical scores.

Of the three campuses having colleges of agriculture, the University of Connecticut at Storrs received a ranking of "1" and a total mean score of 369.9. The University of Massachusetts at Amherst received the final ranking of "2." The differentiation between the three agricultural campuses is clearly defined, as indicated by the significant spread in points. There are 54.6 points separating the campuses receiving a final ranking of "1" and "2" and 46.0 points separating the campuses receiving a final ranking of "2" and "3." It is therefore valid to give the final ranking of "1," "2," and "3" to the respective campuses.

It should be noted that the scores derived for campuses having medical schools involved different elements than the scores for campuses having colleges of agriculture. The total possible scores for the two types of campuses are different, and it is not valid to compare the scores of campuses having medical schools with scores of campuses having agricultural colleges.

Analysis II. This analysis examines the relative merit of all six potential locations by assigning a numerical weighting factor for the presence of a school of medicine or a college of agriculture on the campus. Although all six locations were rated on the basis of the same general campus criteria (with Items 17 and 18 of Appendix E deleted), the colleges of agriculture and the schools of medicine were assessed by using agricultural and medical criteria respectively. It is therefore necessary to normalize the scores received by the schools of medicine and the colleges of agriculture to the same possible maximum score.

By using only the school of medicine criteria, a medical school can receive a possible maximum score of 162.6 points. A college of agriculture can receive a possible score of 200.7 points by using only the college of agriculture criteria. The scores for both sets of criteria are normalized to the same basis (a possible 200.7 points) by multiplying scores received on the school of medicine criteria by the ratio of 200.7 to 162.6 (1.23).

The Advisory Council gave the following two general campus criteria the indicated weights, which show the relative importance of the two criteria:

There is an existing or proposed and funded medical college on the campus.	4.2
There is an existing agriculture college on the campus.	2.9

The normalized scores of medical school and agricultural college criteria are multiplied by the respective weight factors to take into account the relative importance of a medical school and an agricultural college to a veterinary college.

These new weighted scores for (1) medical schools and (2) agricultural colleges are added to the respective general campus criteria scores. The result is a total score for each campus, which can then be compared directly with scores of other campuses. Table 5.4 presents a summary of the scores for all potential locations.

On the basis of the final total scores compared on a weighted score basis, as shown in Table 5.4, the campus of the University of Massachusetts Medical School at Worcester received the highest total score of all six possible locations.

Advantages and Disadvantages of Each Candidate Campus

The use of quantitative rating scales for each criterion not only made it possible to derive the total scores by which the potential locations for a college of veterinary medicine were evaluated in Analysis I and Analysis II, but also made it possible to identify specific advantages and disadvantages of each location. The ratings received by each of the candidate campuses on each of the criteria were examined. These ratings established how well a campus met any given criterion. If the campus received a high or sometimes a medium rating on a criterion, this criterion was listed as an advantage for that campus. If the campus did not meet the criterion or met it minimally and received a low rating, the criterion was considered a disadvantage for establishing a college of veterinary medicine. These advantages and disadvantages by campus follow.

University of Connecticut School of Medicine Farmington, Connecticut

Advantages:

1. The school is centrally located for the seven-state region.
2. The campus is only eleven miles and fifteen minutes from the Hartford airport.

TABLE 5.4 Comparison of Relative Merit of All Six Campuses (Analysis II)

Campus	*Rating School of Medicine Criteria*	*Normalized Score**	*Rating College of Agriculture Criteria*	*Normalized Score**	*Normalized Score X Weight Factor***	*Rating General Campus Criteria*	*Final Total Score*
U. of Massachusetts Worcester	106.7	131.2			561.0	197.9	748.9
U. of Connecticut Storrs			172.2	172.2	499.4	197.7	697.1
Rutgers Medical School Piscataway	92.7	114.0			478.8	150.8	629.6
U. of Connecticut Farmington	92.4	113.7			477.5	145.7	623.2
U. of Massachusetts Amherst			135.0	135.0	391.5	180.3	571.8
Rutgers University New Brunswick			119.5	119.5	346.6	149.8	496.4

*The maximum possible normalized score is 200.7 for school of medicine criteria as well as for college of agriculture criteria.

**Weight factor for medical schools is 4.2; for agricultural colleges, it is 2.9.

3. The one potential site is easily accessible by auto.

4. The campus is 196 miles from the nearest existing veterinary college.

5. The campus can provide computer and power plant facilities and services for the veterinary college; power plant services could be provided on a contractual basis.

6. There are a large number of high-quality satellite facilities which could be used by a veterinary college. (See Appendix F.)

7. The supply of potential companion animals (7,000 patients) and the supply of potential food producing and zoo animals (1,027 mammal patients and a population of 6,659 poultry and zoo animals) are more than adequate for the needs of a veterinary college.

8. The Connecticut veterinarians have actively sought a college of veterinary medicine for over twenty years.

9. A medical school and a dental medicine school are located on the campus.

10. The medical school has a good base for continuing education that is available for veterinary medicine.

11. The medical school attracts sizable sums of money for biomedical research.

12. The human patients in the medical teaching hospital are available for instruction of veterinary medical residents and graduate students.

13. There is a division of laboratory animal medicine within the school of medicine.

14. The division of laboratory animal medicine offers many services to both the school of medicine and the university at large.

Disadvantages:

1. The campus has demonstrated little interest in having a college of veterinary medicine; veterinary medicine was not incorporated into the current or future plans for the medical school.

2. The only land available for use by the veterinary college would cost approximately $30,000 an acre, and much of the land is low and wet. (See Appendix G-1.)

3. The animal research farm, if built on the proposed site, may be a nuisance to the existing health center because of flies and odor.

4. There is minimal public transportation to and from the proposed site; it is possible that service will increase once the Health Center hospital and out-patient clinics are open.

5. There is no campus housing, and there are no school plans for constructing new housing. Private builders are expected to provide only minimal housing.

6. The existing library facilities will not accommodate veterinary medicine.

7. The campus has no plans for providing recreational or student-health facilities and services for the veterinary college; student health services may be provided on a contractual basis.

8. The legislative climate, although indicative of interest in supporting a veterinary college at Storrs, is not supportive of having the new college at Farmington as demonstrated through legislative action over the past decade.

9. There are no teaching or clinical facilities in the school of medicine available for use by a college of veterinary medicine.

10. The laboratory animal medicine facilities in the school of medicine are the only potential research facilities that could be used by a college of veterinary medicine.

11. The division of laboratory animal medicine (a) offers no animal technician training program; (b) has no research program; (c) offers no graduate courses and no residency program for veterinarians; and (d) is not affiliated with an animal farm.

12. The campus is not physically joined to the parent campus and does not enjoy the benefits of a total university environment.

University of Massachusetts
Medical School
Worcester, Massachusetts

Advantages:

1. The institution has demonstrated a high degree of interest in having a college of veterinary medicine; plans for veterinary medicine are included in the current and future plans of the medical complex.

2. The campus is centrally located for the seven-state region.

3. The Worcester Municipal Airport (James D. O'Brien Field) is a regional airport conveniently located four miles west of downtown Worcester.

4. The campus is 265 miles from the nearest existing veterinary college.

5. There is a 128-acre tract of land including a 47-acre portion used by the medical school complex which is available for veterinary medical use. (See Appendix G-2).

6. There is a possibility that the veterinary medical research farm could be placed on land adjacent to these 128 acres through reallocation of state-owned land (Worcester State Hospital holdings) or purchase of contiguous land from the Notre Dame Institute. If this adjacent land is not available, the veterinary medical research farm may be placed at the 1100-acre Grafton State Hospital, about five miles from the medical school.

7. The animal research farm site will not be a nuisance to the surrounding area; poultry and livestock production has been an activity on the site since the early part of the century and has proven to be no nuisance. The land is tillable with good pastures.

8. The general terrain of the proposed sites is extremely good; the land is gently sloping and well-drained.

9. The proposed site is easily accessible by auto.

10. Housing will be no problem because there are plans for apartments near the medical center, and private enterprise provides housing in the general Worcester area.

11. The campus can provide computer, recreational, student health, and power plant facilities and services for the veterinary college.

12. The supply of potential companion animals (5,404 patients) and the supply of potential food-producing and zoo animals (1,902 mammal patients and a population of 8,391 poultry and zoo animals) are more than adequate for the needs of a veterinary college.

13. The legislative climate is very supportive of establishing a college of veterinary medicine at Worcester as demonstrated by a legislative resolution passed in 1972 creating a commission to study the feasibility of having at least the first two years of veterinary instruction at the University of Massachusetts Medical School at Worcester.

14. The veterinarians have been actively supporting the establishment of a veterinary college at Worcester since the early 1960's.

15. There is a medical school located on the campus.

16. The existing medical school library facilities can offer 19,648 square feet to accommodate veterinary medicine, which is more than adequate.

17. The veterinary college would be able to use some of the medical students' laboratories and lecture halls on a temporary basis and the 1,000 seat auditorium on a regular basis for teaching purposes.

18. The continuing education facilities, planned to accommodate health professionals in addition to physicians, can be used by the veterinary college; there will be a dean appointed in the medical school for continuing education.

19. The human patients in the medical teaching hospital are available for veterinary medical student instruction.

20. There is a planned and budgeted division of laboratory animal medicine.

21. The division of laboratory animal medicine and the teaching hospital of the medical school are available for veterinary education and research.

22. The laboratory animal division plans to (a) offer a wide range of services to organizations, (b) institute a research program, (c) offer residency training, and (d) develop an animal research farm.

Disadvantages:

1. The nearest major airport, in Boston, is thirty-nine miles and forty-seven minutes from Worcester.

2. Public transportation to campus is possible but limited until the new medical school facilities are fully operational.

3. There are a number of high-quality satellite facilities in the area; however, in comparison to other candidate institutions, the number of facilities is somewhat lower. (See Appendix F.)

4. Because the medical school is just beginning its operation, the sum of money spent for biomedical research is lower than at the other candidate campuses.

5. There are no animal clinical facilities except those in laboratory animal medicine available for veterinary student use.

6. The division of laboratory animal medicine does not plan to offer an animal technician training program or graduate courses.

7. The campus is not physically joined to the parent institution and does not enjoy the benefits of a total university environment.

Rutgers Medical School
College of Medicine and Dentristry of New Jersey
Piscataway, New Jersey

Advantages:

1. There is a ninety-acre parcel of land (the Newman Farm) owned by the Board of Trustees of Rutgers University that is available for veterinary medical use. Provisions would have to be made to lease the land from the university, in a manner similar to that arranged when the Rutgers Medical School separated from the university and became a part of the College of Medicine and Dentistry of New Jersey. (See Appendix G-3.)

2. The 500 acres which formerly constituted part of Camp Kilmer might be made available as a potential site for a veterinary research farm on a tract formerly occupied by the station hospital, where the land has been graded and drained, roads have been paved, and an existing sewage treatment plant might be refurbished for future use. (Appendix G-4.)

3. The proposed sites are easily accessible by auto.

4. The institution can provide computer, recreational, and student-health facilities and services for the veterinary college.

5. There is a moderately high number of quality satellite facilities which could be used by veterinary medicine. (See Appendix F.)

6. The supply of potential companion animals (5,026 patients) and the poultry and zoo population (3,379 animals) are adequate to meet the needs of a veterinary college.

7. The legislative climate in New Jersey is supportive of the establishment of a veterinary college.

8. The veterinarians in the New Jersey Veterinary Medical Association actively support the establishment of a college.

9. There are a medical school and a pharmacy school located on the campus.

10. The medical school devotes a large sum of money to the biomedical research program.

11. Existing continuing education facilities could be used by the veterinary college; the continuing education programs are going into the community hospitals, and the medical school sponsors seminars. Currently, part of the continuing education program of the New Jersey Veterinary Medical Association and the New Jersey Animal Hospital Attendants Association and periodically the New York-Delaware branch of the American Association of Laboratory Animal Science are held at the medical school.

12. The medical school has a division of laboratory animal medicine. It conducts orientation programs in animal care and restraint including anesthesiology and x-ray positioning and techniques for third-year medical students as part of its course in radiology.

13. The division of laboratory animal medicine offers (a) a wide range of services to the biology departments in all Rutgers University colleges and to the Institute of Microbiology, the Center for Alcohol Studies, and the Bureau of Biological Research; (b) technical training in laboratory animal medicine; and (c) a graduate course in pharmacological toxicology.

14. The division of laboratory animal medicine would be potentially available for veterinary education and research.

Disadvantages:

1. The school showed little interest in having the college of veterinary medicine. Past plans of the medical school did not include a college of veterinary medicine.

2. The school is not centrally located for the seven-state region.

3. The nearest airport in Newark is about thirty miles and forty-five minutes away from Piscataway.

4. The nearest existing veterinary college is only fifty-one miles from Piscataway.

5. There is an intra-university bus system from New Brunswick to Piscataway which would be available to personnel of the medical school, but the medical school itself has no on-campus bus system.

6. The animal research farm site would be a nuisance to the surrounding area because the prevailing wind is in the direction of the existing Livingston College and its holdings for expansion.

7. The supply of potential large mammals (761 patients) is low in relation to numbers available at other candidate institutions.

8. Housing would be a problem because the cost of construction is very high and the land adjacent to the campus is not available for purchase either by private enterprise or the institution. The institution does not plan to construct student housing.

9. The existing library is already overloaded by medical student use and could not accommodate veterinary medicine.

10. The existing power plant could not accommodate veterinary medicine.

11. The existing teaching facilities in the medical school could partially be used by graduate students, but no facilities are available for professional students.

12. There are no clinical facilities available for veterinary student use.

13. The human patients in the medical teaching hospital are not available for veterinary medical student instruction except under unusual circumstances.

14. The division of laboratory animal medicine does not have a research program and does not offer internship or residency training.

University of Connecticut
Storrs, Connecticut

Advantages:

1. The institution has demonstrated a high degree of interest in having a college of veterinary medicine.

2. The campus is centrally located for the seven-state region.

3. There is a 100-acre tract of land on campus available for veterinary medical use. (See Appendix G-5.)

4. There is a 120-acre pathobiology research farm available as a potential site for the veterinary medical research farm. (See Appendix G-6.)

5. The general terrain of the proposed sites has good drainage potential and good soil and could support construction and landscaping.

6. The proposed site is easily accessible by auto.

7. The institution is 238 miles from the nearest existing veterinary college.

8. The veterinary research farm site, located at the existing pathobiology research farm, would not be a nuisance to the area. The existing farm has proven to be no problem.

9. The institution can provide computer, recreational, student health, and power plant facilities and services for the veterinary college.

10. There are a large number of high-quality satellite facilities which could be used by veterinary medicine. (See Appendix F.)

11. The supply of potential food producing and zoo animals (2,332 mammal patients and a population of 25,868 poultry and zoo animals) is more than adequate for the needs of a veterinary college.

12. The legislative climate, demonstrated by legislative action and bills proposed over the last decade, is very favorable for supporting the college.

13. The Connecticut veterinarians have actively sought a college of veterinary medicine for over twenty years.

14. A college of agriculture and a college of pharmacy are located on the campus.

15. The college of agriculture operates an agricultural experiment station.

16. There is a veterinary extension program.

17. The agriculture college has an active continuing education program that would be available for veterinary medicine.

18. The college offers a two-year program in animal science.

19. There is a division of laboratory animal resources to serve the entire university.

20. The college allocates both personnel and funds toward its biomedical research program.

21. There is a large sum of money devoted to veterinary research.

22. There are a pathobiology department and a veterinary science library within the college of agriculture.

23. There is a 300+ acre veterinary research farm, affiliated with the university, four miles from the campus.

24. The agricultural college has a program in pre-veterinary medicine and also offers the M.S. and Ph.D. in animal diseases, specializing in pathogenic bacteriology, biochemistry of disease, comparative pathology, and comparative virology.

25. The pathobiology department operates a diagnostic laboratory supported in part by the state and staffed by ten D.V.M.'s. Accessions include small animals, farm animals, poultry, and wild and laboratory animals.

26. The pathobiology department, which houses the separately funded Northeastern Research Center for Wildlife Diseases, is attracting increasing numbers of native northeast wildlife (and specimens) for diagnostic purposes. It is also developing a public information, extension, and graduate training program.

Disadvantages:

1. The nearest major airport, the Hartford-Springfield Airport, is twenty-five miles and thirty minutes from Storrs.

2. Storrs is accessible by public bus four times daily; otherwise, the only public transportation to the campus is by car or freight truck.

3. There may be a housing problem because there is no excess dormitory space and the university has no plans for building new housing; private enterprise does take care of some housing.

4. The potential companion animal patients, specifically dogs and cats (783 patients), may be inadequate for the needs of the veterinary college.

5. Although there is a new university library planned, there has been no money appropriated. The existing library could provide only general library services to the veterinary college.

6. There is no separate agriculture library serving the college of agriculture.

7. There are no residency or internship programs offered by the department of pathobiology.

8. There is no school of medicine on the campus. The University of Connecticut School of Medicine is located at Farmington, forty-two miles from Storrs.

University of Massachusetts
Amherst, Massachusetts

Advantages:

1. The campus is centrally located for the seven-state region.

2. There is a 65-acre tract of land in the northeast area of the campus available for veterinary medical use. (See Appendix G-7.)

3. There are approximately 200 acres of land at the Deerfield Farm that constitute a potential site for a veterinary medical research farm.

4. The veterinary research farm site, located northeast of the center of the Amherst campus, would not be a nuisance to the surrounding area.

5. The general terrain of the proposed sites has good soil and good drainage potential.

6. The proposed sites are easily accessible by auto, and there is good public transportation.

7. The institution is 260 miles from the nearest existing veterinary college.

8. Housing would be no problem. There is housing on the periphery of the campus and a complex of apartments for married students.

9. The institution can provide computer, recreational, student health, and power plant facilities and services for the veterinary college.

10. The supply of potential companion animals (1,352 patients) and the supply of potential food producing and zoo animals (2,011 mammal patients and a population of 2,810 poultry and zoo animals) are adequate for the needs of a veterinary college.

11. A college of agriculture and a division of public health are located on the campus.

12. The college of agriculture operates an agricultural experiment station.

13. The college of agriculture has a continuing education program, directed mainly toward major livestock disease problems, that would be available for veterinary medicine.

14. The agricultural college offers a two-year training program in laboratory animal management.

15. The college of agriculture allocates both personnel and money toward its biomedical research program.

16. There is a large sum of money devoted to the extension-diagnostic service program.

17. There is a moderate amount of money devoted to veterinary research.

18. There is a veterinary and animal sciences department within the college of agriculture.

19. There is an existing program in pre-veterinary medicine. Also, there are programs for the M.S. and Ph.D. in animal sciences, specializing in mammalian and avian biology with options in genetics, physiology, nutrition, and animal diseases; and the M.S. and Ph.D. in wildlife or fisheries biology.

20. The veterinary and animal sciences department operates one large animal diagnostic laboratory and one poultry diagnostic laboratory staffed by a total of five D.V.M.'s.

Disadvantages:

1. Although there is interest demonstrated in having a veterinary college in Massachusetts, this interest is not directed toward having the proposed college at Amherst.

2. The nearest airport, the Hartford-Springfield airport, is thirty miles and thirty-seven minutes from Amherst.

3. There are a number of high-quality satellite facilities in the area; however, in comparison to other candidate campuses, the number of facilities is somewhat lower. (See Appendix F.)

4. Although the legislative climate of Massachusetts as a whole is supportive of a veterinary college, the attitude seems to favor the institution of the college in some location other than Amherst.

5. The Massachusetts veterinarians are supportive of a new college of veterinary medicine, but seem to favor the establishment of the college in some other area of the state.

6. Although a new library is in the process of being constructed, there is not now nor will there be space for the addition of veterinary medicine; the new college could use existing general library services.

7. There is no library or portions of a library assigned to veterinary science.

8. The veterinary extension program is devoted mainly to dairy science and is thus limited in scope.

9. There is no division of laboratory animal resources to serve the entire university.

10. There is no veterinary research farm affiliated with the university.

11. There are no residency or internship programs offered by the department of veterinary and animal sciences.

12. There is no school of medicine on the campus. The University of Massachusetts Medical School is located at Worcester, forty-seven miles from Amherst.

Rutgers University
New Brunswick, New Jersey

Advantages:

1. The institution has demonstrated a moderate degree of interest in having the college of veterinary medicine.

2. There are thirty-five acres of land next to the animal husbandry area that are available for veterinary medical use. (See Appendix G-8.)

3. There are 150 acres near the beef barns on the edge of the campus available as a potential site for a veterinary research farm. (See Appendix G-8.)

4. The veterinary research farm site would not be a nuisance to the surrounding area because the prevailing winds are in the direction of an ornamental research farm, a woods, and an environmental research farm.

5. The general terrain of the proposed sites has good soil and is able to support construction and landscaping.

6. Public transportation to and from the proposed site is good.

7. The nearest airport, in Newark, is twenty-one miles and twenty-five minutes from New Brunswick.

8. The institution could provide computer, recreational, and student health services and facilities for the veterinary college.

9. There is a moderately high number of quality satellite facilities which could be used by veterinary medicine. (See Appendix F.)

10. The supply of potential companion animals (5,026 patients) and the poultry and zoo population (3,379 animals) are adequate to meet the needs of a veterinary college.

11. The legislative climate in New Jersey is supportive of the establishment of a college of veterinary medicine.

12. The veterinarians in the New Jersey Veterinary Medical Association have actively sought a college.

13. There is a college of agriculture located on the campus.

14. The college of agriculture operates an agricultural experiment station.

15. The college has a veterinary extension program.

16. The college allocates both personnel and funds toward its biomedical research program.

17. The college of agriculture has an animal sciences department.

18. There is an existing program in pre-veterinary medicine. The college also offers the M.S. and Ph.D. in animal science, specializing in animal breeding and genetics, animal physiology, animal nutrition, and animal pathology.

19. The animal sciences department operates two poultry diagnostic laboratories staffed by a total of three D.V.M.'s.

Disadvantages:

1. The campus is not centrally located for the seven-state region.

2. New Brunswick is only fifty-nine miles from the nearest existing college of veterinary medicine.

3. The sites are accessible by auto, but the highways and freeways are heavily congested.

4. Housing may be a problem because the university cannot now provide accommodations nor are there plans for university housing; no housing is provided by private enterprise, and the cost of construction is very high.

5. The potential supply of large mammals (761 patients) is low in relation to numbers available at other candidate institutions.

6. The existing power plant cannot accommodate veterinary medicine. A central power plant is now under consideration.

7. The main library is not located on the agriculture college campus and may not be convenient for providing general library services.

8. The agriculture library is currently being relocated into another college library; only a research library will remain in the present facilities, and there would be no space for the accommodation of veterinary medicine.

9. There is no library or portions of a library assigned to veterinary science.

10. Continuing education for veterinarians is not provided through the university, but through cooperation between the university and other organizations throughout the state.

11. The college of agriculture does not offer an animal technician training program.

12. The college of agriculture has no division of laboratory animal resources to serve the entire university.

13. There is no veterinary research farm affiliated with the university.

14. There are no realistic data available indicating the amount of funds spent on veterinary extension-diagnostic or veterinary research programs.

15. There is no school of medicine on the campus. The Rutgers Medical School is located at Piscataway, three miles from New Brunswick.

Conclusions from Campus Evaluations

Because of (1) the "Need Study" recommendation, (2) the definite advantages of having a medical school and a college of veterinary medicine located on the same campus, and (3) the high rating received in the rating system analyses, the project staff evaluation team concluded that the campus of the University of Massachusetts Medical School at Worcester is the optimum location for the proposed college of veterinary medicine for New England and New Jersey.

FINDINGS OF MASTER PANEL

In order to validate the findings and conclusions of the project staff, a Master Panel composed of five professionals in the field of veterinary medicine was convened with responsibility to review the application of the rating scales to the compiled data and the ensuing results. The members of the Master Panel brought to bear diverse educational backgrounds and professional experience encompassing the practice of veterinary medicine, veterinary medical school administration, education in clinical and basic sciences, development of a college of medicine with an existing college of veterinary medicine, development of a new college of veterinary medicine with an existing college of medicine, accreditation, continuing education, research, graduate education, veterinary medical specialties, curriculum and student affairs, program and facilities planning, and financial analysis.

The Master Panel deliberation produced the following unanimous statement:

> Regarding the actual methodology and logic behind evaluating alternative sites, the Master Panel agreed that the methods of survey were exhaustive, well-organized and appropriate.
>
> Among the six sites investigated as possible locations for the proposed college, the Master Panel agreed with the ["Need Study"] recommendation that only sites with medical colleges should be considered. Of the remaining candidate institutions, the Master Panel unanimously agreed that the proposed college should be placed at the University of Massachusetts at Worcester in view of the available data. Worcester had few deficiencies and offered many possibilities for development.
>
> There were several limitations pointed out by the Master Panel. First of all, the Worcester Medical School is not fully operative and therefore cannot be judged as to basic objectives including the thrust of the college for excellence in educational opportunities and the basic philosophy of the faculty and administration. Second, an official statement as to the interest or non-interest of Harvard in having the proposed college has not been received and should be pursued further.* Although an affiliation of this sort (that is, with a private institution) may present some special problems,

the outstanding intellectual environment and potential environment for flexibility warrant further investigation.

*Note: Indication of non-interest was later received orally.

CONCURRENCE OF ADVISORY COUNCIL

The conclusions of the location study were examined by the Advisory Council in a meeting with the project staff. The Council concurred with the methods employed, the results obtained, and the conclusions drawn.

RECOMMENDATIONS

On the basis of the above information, this study (16) RECOMMENDS the placement of the proposed veterinary college for New England and New Jersey on the site of the University of Massachusetts Medical School at Worcester. Establishment of the veterinary college at this location will provide a centralized facility to serve the entire region and also will enhance the educational environment of veterinary and human medicine.

A map of the campus of the University of Massachusetts Medical School which shows the recommended sites for the veterinary college is given in Appendix G. So that economy as well as optimal academic efficiency can be achieved, this study further (17) RECOMMENDS that the basic veterinary medical sciences facility be attached to the existing building housing the basic science department of the medical school. This will result in expansion of the existing departments; for example, physiology will be expanded to include veterinary physiology; anatomy will be expanded to include veterinary anatomy; microbiology will be expanded to include veterinary microbiology; and pharmacology will be expanded to include veterinary pharmacology.

This study also (18) RECOMMENDS that the existing library in the medical school at Worcester, which can provide over 19,000 square feet for veterinary medical use, be shared by the medical school and the college of veterinary medicine.

The veterinary clinical facility should be located far enough away from the human teaching hospital so that there will be no obstruction to the flow of human patients. This study therefore (19) RECOMMENDS that the veterinary clinical facility be located approximatley four minutes walking distance (880 feet) from and adjacent to the basic science departments of the veterinary college.

A veterinary medical research farm is a requirement for all colleges of veterinary medicine. There are 128 acres of land, including forty-seven acres used by the medical school complex, at the Worcester campus of the University of Massachusetts. Adjacent to this campus is the Worcester State Hospital, and Notre Dame Institute owns extensive acreage. Following the closing of Grafton

State Hospital, located about five miles from the University of Massachusetts Medical School, approximately 1100 acres of land became available for reassignment. Costs of staff and student time, travel, and duplication of equipment are minimized by locating the veterinary medical research farm adjacent to the veterinary college.

This study (20) RECOMMENDS that Massachusetts assign 250 acres of land for a veterinary medical research farm from holdings of the Worcester State Hospital or Notre Dame Institute or the Grafton State Hospital.

REFERENCES

1. National Academy of Sciences, *New Horizons for Veterinary Medicine*, Washington, D.C., 1972.

2. New England Board of Higher Education, *The Need for a College of Veterinary Medicine to Serve New England and New Jersey*, 1973.

3. Crawford, Susan, "Libraries in the 1960's: An Overview," Supplement to Vol. 60 of the *Bulletin of the Medical Library Association*, April, 1972.

4. The University of Vermont, "Report of Committee Concerning Veterinary Medical Education," 1972.

6. COSTS OF THE PROPOSED COLLEGE

COST OF LAND

The availability of acreage for the proposed college of veterinary medicine is an important factor in consideration of a potential site. In 1969 a land survey conducted by the College of Veterinary Medicine of Ohio State University [9] showed a mean of 324.1 acres of land for veterinary medical use, based on data of sixteen of eighteen U.S. veterinary colleges reporting. Eleven divided the use of land into two categories: (1) land on campus and (2) land adjacent to the campus (research farm, animal facilities, experiment stations, etc.). A mean of 47.2 acres of land on campus was reported, while the land adjacent to the campus had a mean value of 285.1 acres. The mean of the total acreage used reported for these eleven schools was 332.3 acres.

Because the recommended location at the University of Massachusetts Medical School at Worcester has adequate land available for veterinary medical use, it more than meets the land specifications outlined above. The cost of purchasing land is therefore not a factor in calculating the cost of the college.

FINANCIAL PLAN FOR CONSTRUCTION AND FIXED EQUIPMENT

Space Planning

The existing colleges of veterinary medicine differ in number and configuration of facilities, amount of building and outdoor space, and utilization of space. The differences are due to a number of factors, such as climate, the age of the institution, the design of the professional curriculum, graduate and residency educational programs, research components, service courses and programs, and proximity to other related institutions and activities.

The University of Illinois has conducted in-depth studies of space needs including veterinary medicine [1]. In addition, The Ohio State University, Division of Campus Planning and College of Veterinary Medicine, completed a detailed study to determine space-planning factors for the College of Veterinary Medicine [2]. The space-planning factors derived by the two studies were used to determine the space required for the proposed regional college of veterinary medicine (CVM). Although these studies approached the problem of space needs differently, there is very little variation in totals of required net assignable space resulting from the two methods.

Multiple highly specialized activities and functions require complex facilities and fixed equipment which are costly. Modification and expansion of health professions educational facilities for the purpose of increasing enrollment are excessively expensive and result in inefficiencies which increase annual operating costs. For these reasons, it has been recommended that facilities for a college of

TABLE 6.1 Institutional Data for Space Calculations

Enrollment		
Professional Students (D.V.M.)		
1st Year FTE*	96	
2nd Year FTE	96	
3rd Year FTE	96	
4th Year FTE	96	
Total		384**
Intern, Graduate, and Resident Students (50 FTE)		
Headcount		100
Other Students***		
Continuing Education		600
Technical Education		30
Faculty		
FTE		96
Dean, Department Chairmen, Hospital Administrator, and Directors		
FTE		12
FTE Faculty Requiring Office Space		108
FTE Staff Requiring Office Space		94
FTE Faculty and Staff Requiring Locker Space		165
Classroom – Weekly Student Hours		4,246
Laboratory – Weekly Student Hours		6,444
Library – Multi-Media Learning Resources, Periodicals, and Books (equivalent volumes)		45,000

*Full time equivalent.

**An attrition rate has not been applied to enrollment of professional students. Competition for admission is so great that only students of very high quality are accepted. Almost without exception, the few students who drop out do so temporarily for non-academic reasons. For facility planning purposes, a "zero" attrition rate is considered appropriate as replacements may be made to fill any openings.

***Continuing education and technical education students are scheduled to utilize facilities at hours when not occupied by professional and graduate students.

veterinary medicine to serve New England and New Jersey be constructed for a total of 1,114 students. This number represents 384 professional students (96 per entering class), 100 (50 FTE) post-D.V.M. students, 30 technical students, and 600 continuing education students. (See Chapter 4.)

With seven states participating in the development of the college, student demand for admission and the need for veterinarians will dictate a progressive increase in class size. Facilities should be designed architecturally so that expansion of facilities to accommodate up to 176 professional students per class far in the future can be accomplished prudently and efficiently.

Institutional data designed to give a profile of the proposed college's

enrollment, faculty, classroom and laboratory weekly student hours, and volumes in the library are established as the basis for projecting space requirements. The institutional data described in Chapter 4 outline the number of faculty required for (a) all instruction (veterinary students, interns, residents, graduate students, continuing education, and technical education); (b) professional community services (patient care, diagnostic services, extension services, and services to other colleges in the university and government agencies); and (c) research. The institutional data used for calculating the space requirements for the new college are given in Table 6.1.

Net assignable square feet (NASF) is defined as all areas of a building which are assigned to, or available for assignment to, an occupant, including every type of space functionally usable by an occupant, excluding circulation (corridors, elevators, stairways, and lobbies), mechanical, and custodial areas. Detailed allocations of NASF to the various teaching, research, and service functions and the respective costs depend on the final site selection and the specific programs to be implemented. In consideration of such factors, a later section of this chapter will document in detail any deductions from total projected costs which can be made for existing facilities shared by the medical school.

The institutional data given in the preceding table were used in each of the two methods of calculating total space requirements. (See Appendices H and I.) The results of these calculations are given below.

Application of Two Methods to Derive Space Requirements

Space Planning Factors	*NASF Required for Proposed College**
Illinois [1]	258,050
Ohio [2]	264,320

*All buildings including the veterinary teaching hospital.

Actual space utilization experience at the University of Illinois and The Ohio State University substantiates the space requirements as shown in the summary and the space planning factors used by both Illinois and Ohio. A final precise program of facility requirements should be developed for the site with the facts available at the time a decision is made to establish the college.

Calculation of Costs of Model Interstate College

Construction costs are customarily expressed in dollars per gross square foot (GSF). Gross square feet is defined as all floor areas inside the walls of a building expressed in square feet. Approximately sixty-five percent of the total square feet of modern scientific and medical buildings is useable net space for teaching, research, and service [3]. The remaining thirty-five percent of the space is required for such items as mechanical areas, walls, corridors, elevators, lobbies, stairs, lavatory facilities, and janitor closets.

The Ohio planning factors (Appendix I) resulted in a requirement of 264,320 NASF. The Illinois planning factors (Appendix H) and the established institutional data yielded a requirement of 258,050 NASF for the proposed CVM, thus lending concurrent validity to the space estimates. If sixty-five percent of the facility is NASF, then 397,000 is total gross square feet (258,050 NASF ÷ .65 = 397,000 GSF) by using the Illinois planning factors.

Building construction cost data published by the Robert Snow Means Company [4] were reviewed. This publication indicates that the cost per gross square foot of college science, engineering, and laboratory facilities for projects located throughout the United States projected to mid-1973 is $47.20 [4, p. 189]. The 75th percentile cost was selected because fixed equipment and site improvement are included at this level [4, p. 188].

An analysis of contract valuation and building floor area from data provided by the F. W. Dodge Division, McGraw-Hill Information Systems Company, pointed out that the valuation per square foot of hospital and institutional buildings showed the highest increase during the period 1967-71, an average annual rate of ten percent [5]. Educational buildings had an average annual rate increase of 8.5 percent. According to the Dodge statistics, hospital and educational buildings were also among the top three types of structures showing the highest absolute valuation per square foot of floor area. Escalated to mid-1973 at the rate of ten percent, hospital costs appear in this manner: U.S. – $46.54, Region I (all of New England) – $56.52, and Region II (seven states including New Jersey) – $55.35. Educational building costs can be projected to mid-1973 by using the factor of 8.5 percent: U.S. – $33.08, Region I – $43.06, and Region II – $40.58.

Buildings for colleges of veterinary medicine (which have been constructed or are under construction or for which awards have been made for construction) in which the National Institutes of Health (NIH) participated averaged $44.71 per gross square foot adjusted to July 1, 1972 [6]. Up to January, 1973, NIH used an escalation factor of eight percent. From January 1973 to April 1973, NIH used an escalation factor of ten percent. Even though effective corrective action may be taken by the government to curb inflationary trends, it is anticipated that the escalation will not be less than eight percent in the future. This analysis leads to the conclusion that for the interstate college of veterinary medicine an eight percent escalation factor should be used for projecting construction costs.

Total city construction cost index figures from several major appraisal and construction indexes (U.S. average is 1.00) commonly used were investigated for Boston and Worcester:

City	*Construction Cost Index*	*Reference*
Worcester, Mass.	.93	Means Cost Data 1973 [4]
Boston, Mass.	1.05	Dodge Manual 1973 [7]
Boston, Mass.	1.03	Means Cost Data 1973 [4]

Since these city indexes are so nearly the U.S. average of 1.00, it was concluded that a cost index factor should not be applied in calculating the cost of the proposed CVM at Worcester.

Based on the eight percent escalation factor, construction costs for the proposed college for 1973 projected through 1978 are portrayed in Table 6.2.

TABLE 6.2 Projected Construction Costs Required for the Model Regional Veterinary College at 8% Annual Escalation

Year of Construction	*Gross Sq. Ft. Cost*	*Construction of 397,000 GSF**	*Architectural, Engineering** and Other Fees*	*Total Construction Costs*
1973	$47.20	$18,738,400	$1,873,840	$20,612,240
1974	$50.98	$20,239,060	$2,023,906	$22,262,966
1975	$55.05	$21,854,850	$2,185,485	$24,040,335
1976	$59.46	$23,605,620	$2,360,562	$25,966,182
1977	$64.22	$25,495,340	$2,549,534	$28,044,874
1978	$69.35	$27,531,950	$2,753,195	$30,285,145

*Includes fixed equipment.

**10 percent (used by Ohio State University Office of Campus Planning) consisting of 6% architectural and engineering, 0.5% contract administration, 0.5% general services, and 3% contingency and legal.

Movable Equipment for Model CVM

The cost of required movable equipment for a new health professions college averages fifteen percent of the total construction costs. Fixed equipment, however, is generally included in calculation of the construction costs. In projects partially funded by the federal government, NIH allows fifteen percent of the construction costs for movable equipment, which is considered the normal allowance [8, p. 5].

As indicated in Table 6.2, the total cost of construction of a model regional veterinary college projected to mid-1974 is $20,239,060. By using the fifteen percent factor, it is calculated that the cost of movable equipment to place the new buildings into operation may approximate $3,035,859.

Shared Facilities at the University of Massachusetts

Analysis of the facilities of the University of Massachusetts Medical School at Worcester revealed well-designed instructional and library space which may be shared with veterinary medicine. These shared facilities including movable equipment are considered as a savings amounting to $3,002,720, which are deducted from the requirements for the regional college (Table 6.3). It is anticipated that following the decision to develop the new college, the estimated deductions for shared facilities shown in Table 6.3 will be revised by the Dean of the College of Veterinary Medicine in concert with the Dean of the Medical School.

TABLE 6.3 1974 Construction and Equipment Costs of the College of Veterinary Medicine if Added to the University of Massachusetts Medical School

	Gross Sq. Feet	*Cost of Construction**	*Architectural, Engineering and Other Fees***
MODEL CVM	397,000	$20,239,060	$2,023,906
LESS SAVINGS***	47,120	$2,402,178	$240,218
BALANCE	349,880	$17,836,882	$1,783,688

	Construction Including Fees	*Movable Equipment (15% of Construction)*	*Total Bldgs. and Equipment*
MODEL CVM	$22,261,966	$3,035,859	$25,298,825
LESS SAVINGS***	$2,642,395	$360,327	$3,002,722
BALANCE	$19,620,571	$2,675,532	$22,296,103

*Gross square-foot cost projected to 1974 is $50.98 which includes fixed equipment. (See Table 6-2.)

**10 percent (used by Ohio State University Office of Campus Planning) consisting of 6% architectural and engineering, 0.5% contract administration, 0.5% general services, and 3% contingency and legal.

***Savings = deduction for value of existing facilities, including movable equipment, shared by the University of Massachusetts Medical School with the College of Veterinary Medicine.

FINANCIAL PLAN PERTAINING TO ANNUAL OPERATING COSTS

Three alternative approaches were considered in the development of the annual operating budget: (1) net expenditures approach, (2) program cost approach, and (3) constructed cost approach.

The net expenditures approach provides a simple, direct, and verifiable means for computing operating costs. This method utilizes data on expenditures subject to audit of each of the existing colleges. Distortions may result from omissions of non-cash costs such as volunteer faculty and partial costs of the veterinary medical program assumed by the college of medicine or other colleges on the university campus.

The program cost approach assigns the value of all of the resources that are used in an institution to programs in the college, whether or not financial transactions are involved or reflect the full resource cost. The allocation of costs to each of the programs is difficult and subject to judgment because many individuals in a school are engaged, often simultaneously, in activities of different programs. Because (a) few colleges of veterinary medicine have utilized program budgeting, (b) the results are not subject to financial audit, and (c) program allocation is difficult, this method was considered inappropriate.

The constructed cost approach is a theoretical model for a college constructed by a group of experts (veterinarians, deans, department chairmen, faculty). Resource requirements for all the activities contributing to the programs are developed for the prototype college after the objectives and environmental characteristics are carefully defined. As this approach seeks reliable judgments from experts in the field as to what resources are adequate for programs in an acceptable model college, this method was judged to (a) perpetuate biases resulting from the experiences of the experts and (b) yield results which may be construed as theoretical and unconvincing. Therefore, this approach was abandoned in favor of the net expenditures method.

Calculation of Operating Costs

Using the expenditure (of existing colleges) approach to calculate the annual operating costs for the new college requires that expenditures be related to a common denominator, such as faculty, students, or programs. Chapter 3 described the educational environment of a CVM and concluded that teaching, research, and service are essential and inseparable components. The number and mix of students and the number and type of programs in a CVM are variable. Therefore, the unit cost of the college can best be related to the number of faculty engaged in all functions of the college (instruction, patient care, research, planning, and administration). The faculty number fluctuates only slightly each year; therefore, it is logical to derive a unit cost by dividing the total operating expenditures of a college by the number of faculty.

Overhead costs, also referred to as indirect costs, are defined as those costs that cannot be traced to specific items in the college budget. Overhead includes many fixed costs for services, such as utilities, safety, health, library, parking, computer and university administration, which jointly benefit all faculty, staff, and students and do not vary significantly in proportion to changes in the number of students.

In calculating the costs for the proposed college, all expenditures except indirect or overhead were totaled for the 21 existing U.S. and Canadian colleges of veterinary medicine [10]. The average annual cost per faculty member was determined for each college by dividing the total expenditures by the number of faculty. The 75th percentile derived in this manner is $48,128.27, and the mean is $43,222.75. Allowance for the following factors resulted in the selection of the 75th percentile:

1. the expectation that the new college will be commensurate with the traditionally high quality of other medical institutions in the region,
2. manpower costs for planning and development of the new college,
3. the fact that the calculations include expenditures from all colleges of veterinary medicine (eight are on probationary accreditation because of inadequate funding [11]), and
4. advice of the Master Panel.

The overhead on a per-faculty-member basis was calculated as $6,937.67 at The Ohio State University College of Veterinary Medicine. No comparable data are available from other veterinary colleges. The operating budget, then, was calculated by using $48,128.27 plus overhead of $6,937.67 multiplied by 76 faculty members, a total of $4,185,011. As indicated in Chapter 4, there will be 76 faculty members during the fourth year of operation when four classes are enrolled (386 students of all levels). The above calculations may be employed to derive operating costs for future years as the enrollment expands to 1114. Estimated income from tuition, fees, earnings and Federal grants and contracts would reduce the total necessary appropriation by the seven state legislatures to $2,626,960.

Timetable

Expenses incurred between the time a decision is made to found a college of the health professions and the time students are enrolled are minimized by adhering to a short yet feasible timetable. Start-up costs and timetables for founding twenty-two medical schools were studied by Smythe [12]. The interval between authorization and activation (lead time) ranged from one to eight years, 16 of the 22 schools had a lead time of over two years. The initial operating expenditures ranged from $294,000 to $15.7 million with a median of $2.465 million.

Similar data are not available for veterinary medicine because no new colleges have been activated in the U.S. since 1957. A timetable has been developed (Table 6.4) for the regional college based upon (a) the experience of the lead time required for medical schools, (b) the time schedules of the two new colleges of veterinary medicine currently being planned (Louisiana State University and University of Florida), and (c) the immediate availability of space at Worcester.

Optimistically, legislative actions authorizing the CVM and appropriating $280,000 for the initial year might be accomplished by July 1974. Development of a program of requirements, pre-accreditation evaluation of the plans and programs by the AVMA, and architectural planning should be accomplished between January 1975, and July 1976. Animal patients are utilized for instruction of first-year as well as all other levels of students; therefore, it is imperative that the veterinary teaching hospital be assigned the first priority in phasing the construction program. It is feasible to enroll the first-year class of 64 veterinary students in September 1978, by utilizing facilities of the University of Massachusetts Medical School. Admission of the fourth class of professional students, as well as phasing in continuing education and all levels of post-D.V.M. students, should be feasible in 1981.

SUMMARY AND RECOMMENDATIONS

The availability of acreage for the proposed college of veterinary medicine is an important factor in consideration of a potential site. This study (21)

TABLE 6.4 Suggested Timetable*

Starting Date	*Action*
July 1974	Decision to found regional college of veterinary medicine. Initial appropriation of $280,000 and appointment of dean and his staff for planning programs.
Jan. 1975	Development of program of requirements for facilities.
July 1975	Architectural and engineering planning.
Sept. 1975	AVMA Council on Education pre-accreditation evaluation of plans for programs and their implementation to achieve status of "reasonable assurance" of accreditation.
July 1976	Start construction of veterinary teaching hospital and all facilities not attached to the medical school.
Jan. 1977	Start construction attached to the medical school facilities.
July 1977	Detailed curriculum and learning resources development by core faculty in temporary and shared space.
Sept. 1978	Enroll first-year class of 64 veterinary students in temporary and shared facilities.
July 1979	Occupy veterinary teaching hospital and other veterinary facilities.
Sept. 1979	128 veterinary students (2 x 64) plus post-D.V.M. and continuing education.
Sept. 1980	192 veterinary students (3 x 64) plus post-D.V.M. and continuing education.
Sept. 1981	256 veterinary students (4 x 64) plus post-D.V.M. and continuing education.

*Intended for general planning; to be revised by the dean and veterinary faculty in cooperation with university officials.

RECOMMENDS that, inasmuch as the University of Massachusetts Medical School has adequate land available for veterinary medical use, the cost of purchasing land should not be a factor in calculating the cost of the college.

Space-planning factors applied to institutional data, including numbers of faculty and various levels of students, result in an estimated requirement for the proposed veterinary college of 258,050 net assignable square feet (397,000 gross square feet).

The calculation of construction costs of a model college of veterinary medicine involves a number of factors, such as cost per gross square foot and a percentage escalation factor for inflation. The cost of a model regional college in 1974 was calculated at $50.98 per gross square foot, including an eight percent annual escalation factor. Deductions were then made for the value of existing facilities to be shared at the University of Massachusetts Medical School.

This study (22) RECOMMENDS that facilities of the medical school be shared with the new college of veterinary medicine for a sizable savings in costs.

Calculations indicate that the new college requires an appropriation of $17,836,900 for construction of facilities plus $1,783,700 for architectural, engineering, and other fees. At the time construction is completed, movable equipment requirements will be an estimated $2,675,500. The appropriation required is calculated by deducting the value of shared facilities at the University of Massachusetts Medical School, $3,002,700, from the projected cost of a model college in 1974, $25,298,800, which includes fixed equipment, architectural and engineering fees, and movable equipment. The result is a balance of $22,296,100 to be appropriated for capital costs, less an amount up to 75 percent which conceivably might be provided by the federal government and private sources.

Based on the net expenditures approach, this study (23) RECOMMENDS that annual operating funds be phased up to $4,185,000 in the fourth year of operation. Estimated income from tuition, fees, earnings and federal grants and contracts would reduce the total necessary appropriation by the seven state legislatures to $2,626,960.

Start-up expenditures are minimized by adherence to a short yet feasible timetable. This study (24) RECOMMENDS that the decision to found the interstate college of veterinary medicine be made by July 1974, along with an initial appropriation of $280,000 and appointment of a dean and his staff for planning purposes; that construction of the veterinary teaching hospital and all facilities not attached to the medical school start by July 1976; that construction attached to the medical school facilities start by January 1977; and that the first class of veterinary students be enrolled in September 1978, utilizing temporary and shared medical school facilities.

REFERENCES

1. Bareither, Harlan D. and Jerry L. Schillinger, *University Space Planning,* Chicago, Illinois, University of Illinois Press, 1968.

2. Johnson, William M., *Ohio State University College of Veterinary Medicine Space Planning Factors,* Columbus, Ohio (Mimeograph), 1969.

3. Bureau of Health Manpower, *A and E Guidelines,* National Institutes of Health, Bethesda, Maryland.

4. Godfrey, Robert Sturgis, Editor-in-Chief, *Building Construction Cost Data 1973,* 31st Edition, Duxbury, Massachusetts, Robert Snow Means Company, Inc., 1973.

5. Otelsberg, Jonah, "Trends in Valuation per Square Foot of Building Floor Area, 1947-71," *Construction Review,* July, 1972, U.S. Department of Commerce, Bureau of Domestic Commerce, pp. 4-11.

6. Robbins, James, Personal Communication on "Basis for Calculating the Cost of Construction for a College of Veterinary Medicine," Division of Health Professions Education, Bureau of Health Manpower Education, National Institutes of Health, Bethesda, Maryland, April 18, 1973.

7. *Dodge Manual for Building Construction Pricing and Scheduling, 1973,* Annual Edition, No. 8, New York, McGraw-Hill Information Systems Company, Dodge Building Cost Series, 1973.

8. U.S. Department of Health, Education, and Welfare, *Medical Education Facilities,* Public Health Service, Washington, D.C., 1964.

9. Cole, Clarence R. and William M. Johnson, "United States Colleges of Veterinary Medicine Acreage Estimates," The Ohio State University, Columbus, Ohio, (Mimeograph) 1969.

10. Association of American Veterinary Medical Colleges, *Comparative Data Summary, 1972-73 Academic Year, Veterinary Medical Schools and Colleges,* January 29, 1973 (Privileged information, courtesy of the Association).

11. Decker, W. M., Assistant Executive Vice-President, American Veterinary Medical Association, Personal Communication, June 13, 1973.

12. Smythe, Cheves McC., "New Resources for Medical Education: Start-Up Expenditures in 22 New U.S. Medical Schools," *Journal of Medical Education,* Vol. 47 (September, 1972), pp. 690 701.

7. SOURCES OF NON-STATE APPROPRIATED FUNDS

FEDERAL SUPPORT OF COLLEGES OF VETERINARY MEDICINE

The primary support of veterinary colleges is provided by state appropriations. Although federal statutes currently authorize the support of several programs in a college of veterinary medicine, it is not feasible to consider federal funding in the development of the budget for the proposed college because the level of appropriations and availability of federal funds are uncertain from year to year and provide an unreliable basis for planning. No attempt will be made to predict the dollar amounts of federal funds which might become available to a new college in the future.

Comprehensive Health Manpower Training Act of 1971

Introduction. The 1971 Health Manpower Act authorized special project grants to colleges of veterinary medicine for support of curriculum improvement and revision and enrollment expansion. The act also authorized funds for scholarships and loans to veterinary students. Federal support evolved initially from steadily increasing commitment to biomedical research followed by funds made available to veterinary colleges in part for improvement of the educational environment. In 1971 federal policy moved further to provide direct support for veterinary education.

For purposes of receiving construction assistance under present federal legislation, a new college of veterinary medicine must be planned, programmed, and funded to fulfill all requirements for accreditation. A new school is responsible for initiating a request for reasonable assurance of accreditation from the responsible accrediting body, the American Veterinary Medical Association (Appendix J). Before being provided with this statement of reasonable assurance of accreditation and prior to its first application for construction or other funds from the federal government, a developing college of veterinary medicine should request an evaluation by the AVMA Council on Education. The Council will then designate two or more members to conduct an on-site study of the developing college. The Council will evaluate the site visit report and determine whether or not there is indication of reasonable assurance that the new college will be able to meet the requirements of the "Essentials of an Acceptable Veterinary Medical School" (Appendix K) by the time it has been in operation for two years. These "Essentials" have been incorporated into all aspects of this study so that meeting accreditation standards should not present a problem.

Construction. Under the "Comprehensive Health Manpower Training Act of 1971," the maximum federal share of costs of construction for new schools or major expansion of existing schools was set at 80 percent [1, p. 2]. The

construction program was extended to cover acquisition of existing buildings (but not including the land on which these buildings stand) and the costs of interim facilities to provide space on a short-term "less than ten years" basis while facilities of a more permanent nature are being planned or constructed [1, p. 2].

The Act authorizes certain sums to be appropriated for construction of combined teaching and research facilities [1, p. 2]. Teaching facilities are interpreted as areas dedicated for use by students, faculty, or administrative or maintenance personnel for clinical purposes, research activities, libraries, classrooms, offices, auditoriums, dining areas, student activities, or other related purposes necessary for, and appropriate to, the conduct of comprehensive programs of education. Library and research facilities essential for teaching are designated as eligible for federal participation in the construction of teaching facilities.

The federal participation described above represents the maximum limits provided under law. Evaluation of proposals are made under highly competitive circumstances. As such, many grant applications which are funded may receive less than the maximum federal support provided by law. This is particularly the case since appropriations are uncertain from year to year and provide an unreliable basis for long-term planning.

Priority in approving applications for construction grants may be determined, among other factors, in accordance with the following:

a. the relative need for increased enrollment and the availability of students [2], and

b. the effect of the project in achieving regional and national geographic distribution of training opportunities relative to national health manpower needs [3, pp. 54-55].

Operational Funds. The Secretary of Health, Education, and Welfare is authorized to make annual grants known as capitation grants (support based upon enrollment of students in the D.V.M. program) to colleges of veterinary medicine for the support of the education programs of those schools. The amount of the annual grant to each such school with an approved application shall be computed for each fiscal year as follows: each college of veterinary medicine shall receive not more than $1,750 for each full-time student, and $700 for each enrollment bonus student, enrolled in such school in such year [4, p. 8]. A bonus student is defined as any student in a class that has or had in its first year an enrollment exceeding the enrollment in the preceding year by five percent or five students, whichever is greater.

Health Professions Scholarship Program. This program assists students having exceptional need for financial assistance to undertake the course of study required to become a veterinarian. Each school participating in this program is responsible for selecting the recipients of scholarships and determining the

amount of assistance a student may receive. The maximum scholarship a student may receive for a calendar year is $3,500 or the amount of his financial need, whichever is the lesser [5].

For the fiscal year 1973 and 1974, the grant formula for scholarship funds awarded to colleges is the greater of (1) $3,000 X number of full-time students from low-income backgrounds, or (2) $3,000 X 1/10 the number of full-time students of the school.

Student Loans. The student loan program provides long-term, low-interest loans to assist students having need for financial assistance to undertake the course of study required to become a veterinarian. Funds are allocated to accredited schools of veterinary medicine as well as those of other health professions.

The maximum amount a veterinary student may borrow for an academic year is $3,500, or the amount of his financial need, whichever is the lesser. The interest rate is three percent for all loans made after June 30, 1969.

Each school participating in this program is responsible for selecting the recipients of loans and for determining the amount of assistance a student requires. Loans are repayable to the school over a ten-year period which begins one year after completion of studies. The law provides that if the student agrees to practice veterinary medicine for at least two years in an area in a state which has been determined to have a shortage of and need for persons trained in the profession, the federal government will repay sixty percent of the outstanding principal and interest on any educational loan(s) for the costs of his professional education. An additional twenty-five percent of the loan will be repaid for a third year of practice in such an area [6].

Special Project Grants. The Comprehensive Health Manpower Training Act of 1971 provides for grants to assist schools of veterinary medicine in meeting the costs of special projects. Such a grant may be awarded to accomplish among others one of the following purposes:

a. to develop programs for cooperative interdisciplinary training among schools of medicine, dentistry, veterinary medicine, nursing, public health, allied health, and other health professions schools, including training in the use of the team approach to the delivery of health services;

b. to develop and operate training programs and train for new roles, types, or levels of health personnel, including programs for the training of assistants to health professionals;

c. to research, develop, or demonstrate advances in the various fields related to education in the health professions;

d. to assist in increasing the supply, or improving the distribution, by geographic area or specialty groups, of adequately trained personnel in the health professions needed to meet the health needs of the nation;

e. to establish and operate projects designed to increase enrollment in schools of veterinary medicine;

f. to establish and operate projects designed to increase enrollments from minority or low-income groups; and

g. to plan experimental teaching programs or facilities [7].

General Research Support Grants

The Division of Research Facilities and Resources of the National Institutes of Health (NIH) is authorized by law to sponsor a program providing institutions with funds for building present and long-range institutional strength for health research and training. As funds under this program may be used by the recipients with a considerable degree of freedom, scientific responsibility of the recipient is strongly emphasized in making the awards.

Institutions which received awards in 1962 are considered automatically eligible. Other applicants must have received a minimum of $100,000 in appropriate research project grant awards from NIH during the latest complete government fiscal year. The National Advisory Health Council will also consider the degree of diversity, complexity, and breadth of research activities supported by these grants or by the institution's total health-research activities. The $100,000 eligibility requirement must be reestablished every year.

The award is computed by formula according to the health-related research expenditures of the institutions. The formula is subject to change and is modified from time to time in accordance with operating experience [8, pp. 1859-60].

Animal Resources for Medical Research

The National Institutes of Health awards project grants for the improvement of animal resources for medical research. Specific types of projects that may be supported include developing and defining new animal biological models, developing and improving institutional animal resources, developing and maintaining diagnostic laboratories, improving the health and well-being of research animals, and gathering and disseminating information on research animals.

Colleges of veterinary medicine conducting programs in biomedical research may apply for an animal resources grant. The proposed grant must serve qualified biomedical investigators on a regional or national basis [9, p. 1419-2]. Grant applications are reviewed according to need for the project and quality of research facilities and personnel.

Animal Health Research Act

The Animal Health Research Act was developed by the AVMA Council on Research and supported in Congress by the AVMA in 1972 [10, p. 608]. The bill was reintroduced into Congress in 1973 and is still pending [11]. The act is

designed to assist states in carrying out a program of animal health research. Among those institutions eligible for money appropriated under this act are all accredited colleges of veterinary medicine.

Under the provisions of this bill, Congress would be authorized to appropriate funds for the following purposes:

a. to support continuing research programs by meeting the expenses of conducting research, publishing and disseminating research results, administrative direction, purchase of equipment and supplies, and alteration or renovation of buildings;

b. to support research on specific national or regional animal health problems by paying the costs listed in [1]; and

c. to support the costs of providing veterinary medical research facilities, which costs may include the purchase of land, construction or remodeling of buildings, and buying and installing research equipment [12].

Hatch Act

The Hatch Act of 1887 and other laws stemming from this act provide federal funds for agricultural research in the agricultural experiment stations established at land grant universities [13, p. 47]. A part of agricultural research includes veterinary research. As a part of the University of Massachusetts, the proposed college at Worcester is eligible and should receive Hatch Act funds through the Agricultural Experiment Station of the University of Massachusetts at Amherst.

Other Federal Support

Colleges of veterinary medicine are eligible to apply to federal agencies and compete for grants and contracts to support research and research training, libraries, biomedical communication, and international veterinary medicine. The National Institutes of Health (Public Service Act of 1944) is the source of the largest amount of grant funds available to colleges of veterinary medicine.

OTHER SOURCES

State-supported universities strive to build endowments and acquire funds for special projects from foundations and private donors as well as from federal agencies. The *1972 Annual Register of Grant Support* [14] provides the academic and professional community a comprehensive up-to-date list of existing forms of financial aid (government and private). The 1971 edition lists the following numbers of sources of funds: 111 for medical education and training, 41 for cancer, 17 for continuing education, 45 in environmental sciences, 113 in medical research, and 229 in medical sciences; only 7 (2 private and 5 federal) are listed specifically for veterinary medicine.

In a search of foundation directories, no foundation or other non-governmental sources of funds were found for construction of facilities specifically for veterinary colleges [15]. In consideration of the available information, it is clear that veterinary colleges may compete with other biomedical institutions for operating funds for specific projects (fellowships, scholarships, research). It is not feasible for the proposed college to develop a stable and reliable financial base upon gifts and grants from foundations and private donors. It is, however, recommended that the new college be aggressive and skillful in the development of proposals and in seeking financial support of its programs from foundations, industry, and private donors as well as from federal agencies.

Veterinary colleges also generate a certain amount of operating income from professional activities in the teaching hospital, diagnostic laboratory and ambulatory service. The income so generated at the proposed college will be minimal in the early years of operation but will increase over time.

TUITION

The National Academy of Sciences, Institute of Medicine, is studying the annual cost of education for students in medicine, veterinary medicine, and other health professions. The eighteen-month study will not be completed until 1974. In general, the annual cost of education for veterinary students is similar to that for medical students [13, p. 112; 16, p. 68], which implies that tuition levels should also be similar to that for medical students.

RECOMMENDATIONS

It is not feasible to include federal and other non-state funding in the development of the budget for the proposed college because the level of appropriations and availability of such funds are uncertain from year to year and provide an unreliable basis for planning. This study (25) RECOMMENDS that the new college be funded by the participating states for both construction and operating purposes.

It is essential that college administrators seek federal participation in construction with utmost vigor and expertise. If the college is successful in obtaining federal funds for construction, this study (26) RECOMMENDS that such funds obtained be used as a credit proportional to the amount of participation by each state.

It is feasible for the college, in competition with biomedical institutions, to obtain gifts and grants for special projects (scholarships, fellowships, research). This study (27) RECOMMENDS that the veterinary college be aggressive and skillful in seeking financial support of its programs from foundations, industry, and private donors, as well as from federal agencies.

This study (28) RECOMMENDS that the level of tuition for veterinary students be identical to that for medical students on the same campus.

REFERENCES

1. Bureau of Health Manpower Education, National Institutes of Health, U.S. Department of Health, Education, and Welfare, *Highlight Summary of "Comprehensive Health Manpower Training Act of 1971,"* November, 1971.

2. "Title 42-Public Health," *Federal Register,* Vol. 37, No. 191 – Saturday, September 30, 1972.

3. *Applicant's Program Guide and Instructions, Tentative,* "Federal Assistance for the Construction of Health Professions Educational Facilities under Title VII of the Public Health Service Act, as Amended," March, 1972.

4. Public Law 92-157, 92nd Congress, H.R. 8629, November 18, 1971, "An Act to amend title VII of the Public Health Service Act to provide increased manpower for the health professions, and for other purposes."

5. "Health Professions Scholarship Program," U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, Bureau of Health Manpower Education, Division of Physician and Health Professions Education, Bethesda, Maryland. Revised April, 1972.

6. "Health Professions Student Loan Program," U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, Bureau of Health Manpower Education, Division of Physician and Health Professions Education, Bethesda, Maryland. Revised April, 1972.

7. "Health Professions Special Project Grants," U.S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, Bureau of Health Manpower Education, Division of Physician and Health Professions Education, Bethesda, Maryland. July, 1972.

8. "General Institutional Support," *College and University Reports, Topical Law Reports,* Washington, D.C.: Commerce Clearing House, Inc., 1972, pp. 1859-60.

9. "Institutional Programs," *College and University Reports, Topical Law Reports,* Washington, D.C.: Commerce Clearing House, Inc., 1971, p. 1419-2.

10. *Journal of the American Veterinary Medical Association,* Vol. 162, No. 8 (April 15, 1973).

11. Maurer, Fred D., Associate Dean, Texas A & M University, Personal Communication, April 11, 1973.

12. "A Bill to Authorize the Secretary of Agriculture to Encourage and Assist the Several States in Carrying Out a Program of Animal Health Research," S. 1388, March 27, 1973.

13. National Academy of Sciences, *New Horizons for Veterinary Medicine,* Washington, D.C., 1972.

14. Renetzky, Alvin, Editor-in-Chief, *Annual Register of Grant Support,* Orange, New Jersey, Academic Media, 1972.

15. Lewis, Marianna O., Editor, *The Foundation Directory,* Edition 4, New York, Columbia University Press, 1971.

16. The Carnegie Commission on Higher Education, *Higher Education and the Nation's Health,* New York, McGraw-Hill Book Company, October, 1970.

8. EQUITABLE BASIS FOR STATE PARTICIPATION

INTRODUCTION

The primary aspects of state participation considered in this chapter are student space allocation and a basis for funding of the proposed college of veterinary medicine. Derivation of equitable formulas for student space allocations and construction and operational funding requires consideration of benefits of the college to the host state as well as contributions of the host state to the college.

The consortium or interstate cooperation method of sharing the cost of education is not new in veterinary medicine. Three different multiple state arrangements, the New England Board of Higher Education (NEBHE), the Southern Regional Education Board (SREB), and the Western Interstate Commission for Higher Education (WICHE), have been providing medical and, in the case of the latter two, veterinary medical education for residents of their respective regions for over twenty years. These boards were formed on the basis of interstate compacts to capitalize on the existing resources in their regions to meet manpower deficiencies and operate a wide variety of services and diverse activities to meet regional needs.

In the field of veterinary medical education, SREB and WICHE utilize the interstate contract mechanism to implement effective sharing of resources and costs. Under the SREB arrangement, a contract for service permits a state which does not offer veterinary medical education, or wishes to augment its capacity, to send its students to a state having an institution which offers veterinary medical education. The contracts are negotiated for student spaces within each of these institutions. A quota is established in terms of entering students; and appropriations are made in advance by the state legislatures annually or biennially, on the basis of projected total quotas [1, p. 5].

The contractual policies of SREB and WICHE may be adaptable in part for the proposed college in the seven-state area. There are some major distinctions, however, which make the three regions different from each other. Both the SREB and WICHE contract for student spaces in more than one institution, while there is only one proposed college of veterinary medicine (CVM) to serve the seven-state region involved here. Secondly, and most important, since there is no existing CVM in the region with which to contract, both construction and operating costs for the proposed college are expected to be shared by all seven states, whereas all contracts to date have been negotiated by SREB and WICHE to reflect only a fraction of the operating costs.

In view of the lack of precedent for the long-term capital commitments required for the cooperative support of a college of veterinary medicine by a number of states, a variety of formulas for the equitable participation by each state for capital and long-term operating liability were generated and evaluated.

STUDENT SPACE ALLOCATIONS

Since the proposed college of veterinary medicine is a unique regional facility, a plan for allocating student spaces among the states must be devised. As discussed in Chapter 4, the planned enrollment of the new college is 1114 students. It is anticipated that an adequate number of spaces will exist for all interns, residents, graduate students, technical students, and continuing education students who are residents of the seven states and wish to enroll. Therefore, no space allocation formula is necessary for the above levels of students.

It is not feasible, however, for the college to accommodate the multitude of applicants for admission to the doctor of veterinary medicine (D.V.M.) program. Among the total enrollment of 1114 students, it is expected that the professional (D.V.M.) students will number 256 initially and expand to 384 after faculty and other resources are available. Two plans for allocating D.V.M. student spaces among the states were developed and evaluated: (1) student allocations proportional to the population of each state and (2) student allocations proportional to the number of qualified applicants from each state.

Under the state-population plan, each state is allocated student spaces in the same proportion that the state population is to the total seven-state population. The populations, per capita income [2], and revenue of the seven states [3] are given in Table 8.1.

TABLE 8.1 Relationship of Populations, Per Capita Income, and Revenue

State	*Population*	*Per Capita Income**	*Revenue***
New Jersey	7,168,164	$4811	$2,116,000,000
Massachusetts	5,689,170	4562	2,159,000,000
Connecticut	3,032,217	4995	1,091,000,000
Maine	993,663	3375	349,000,000
Rhode Island	949,723	4126	379,000,000
New Hampshire	737,681	3796	193,000,000
Vermont	444,732	3638	237,000,000

**Survey of Current Business,* August, 1972.

***The American Almanac, The Statistical Abstract of the U.S.,* 93rd Ed., Bureau of the Census.

An example of the calculation of the number of student spaces for one state under this plan is as follows:

Connecticut has $\frac{3,032,217}{19,015,350}$ or 15.9 percent of the seven-state population.

15.9% of 256 (D.V.M. Enrollment) = 41
15.9% of 384 (D.V.M. Enrollment) = 61

The state-population plan has an advantage in that the number of students to be accepted from each state is established by the official population figures of the U.S. Census Bureau. The relatively stable distribution of student spaces under this plan facilitates planning with regard to financial obligations of the states as well as numbers of students who will be accepted.

Another plan for allocation of D.V.M. student spaces is the qualified applicant plan. One measure of the need for D.V.M. student spaces by a state is the number of qualified applicants from that state. Student space allocations may be made proportional to the number of qualified applicants from each state in the prior year or proportional to an average number of applicants over a specified number of years.

One may use the number of qualified applicants to the University of Pennsylvania School of Veterinary Medicine and Cornell University College of Veterinary Medicine as a basis for establishing allocations of student spaces for the first year. As explained in Chapter 4, most New England and New Jersey applicants apply to the University of Pennsylvania and Cornell University. For purposes of illustration here, the number of applicants from the seven-state region to the University of Pennsylvania for the academic years 1968–72 is used. In these five years, total applicants were as follows: Connecticut – 108; Maine – 27; Massachusetts – 163; New Hampshire – 30; New Jersey – 340; Rhode Island – 34; and Vermont – 16 [4, p. 37]. Each state, then, may be allocated student spaces according to the number of applicants it had over the total number of regional applicants, 718.

An example of the calculation of the number of student spaces under this plan is as follows:

Connecticut had $\frac{108}{718}$ or 15.0 percent of the total number of seven-state applicants to the University of Pennsylvania School of Veterinary Medicine.

15.0% of 256 (D.V.M. Enrollment) = 38
15.0% of 384 (D.V.M. Enrollment) = 58

Connecticut, then, may be allocated 38 student spaces based on a D.V.M. student enrollment of 256 and 58 spaces based on an enrollment of 384 in the college of veterinary medicine.

This plan has an advantage in that the D.V.M. student spaces are allocated in direct proportion to the number of qualified students seeking enrollment from each state. The plan has a disadvantage in that the number of student spaces for each state, and ultimately the state's monetary obligation, are not accurately predicted in advance. Table 8.2 compares the number of student spaces allocated to each state under the two plans.

So that the degree of correlation of space allocations under the two plans can be determined, a Pearson correlation coefficient was calculated as 0.96 (a perfect correlation would give a correlation coefficient of 1.00). The high value of the correlation coefficient indicates, as may be implied by comparing the data in Table 8.2, that the space allocations calculated under the two plans are similar.

TABLE 8.2 Veterinary Student Space Allocations Under Two Plans

	Percent of Total		*Student Spaces*			
			256		*384*	
State	*Applicants*	*Population*	*Applicant Plan*	*Population Plan*	*Applicant Plan*	*Population Plan*
N.J.	47.4	37.8	121	97	182	145
Mass.	22.7	29.9	58	76	87	115
Conn.	15.0	15.9	38	41	58	61
Me.	3.8	5.2	10	13	15	20
R.I.	4.7	5.0	12	13	18	19
N.H.	4.2	3.9	11	10	16	15
Vt.	2.2	2.3	6	6	8	9

While allocations based on number of qualified applicants can be considered a measure of the *need* for student spaces, population and state revenue can be considered as measures of the *ability* of a state to pay for veterinary medical education. As may be seen in Table 8.1, the distribution of state revenue is quite consistent with the distribution of state population. Therefore, the high correlation between the two allocation plans is interpreted as a high correlation between need for student spaces and ability to share costs of the college of veterinary medicine. Because of this high correlation, it is concluded that the population formula is as equitable as, and administratively more feasible than, the applicant plan for allocating student places to each of the seven states. Furthermore, the states having the highest populations and the largest share of the veterinary students also have the highest amount of state revenue and are financially able (Table 8.1) to fund proportionally more of the college budget.

Allocation of spaces to each state assumes, of course, that each state will have a sufficient number of qualified applicants to the college, an assumption justified by the student application data presented in Chapter 4. Actual evaluation of the applicants and admission to the college should be the responsibility of the college, but it is not anticipated that there will be significant deviations from the formula based on population.

BENEFITS TO HOST STATE

A complete analysis of the benefits derived by a host state from a regional college of veterinary medicine requires an extensive treatment not within the scope of this study. A brief analysis to identify some of the major benefits is given, however, so that an equitable formula for sharing costs of the new college can be developed. The benefits to the host state are viewed as direct and indirect economic benefits, several aspects of which are considered here. The benefits

discussed in the following sections are intended to place the effects of the new college in perspective and are not meant to be comprehensive.

Indirect Economic Benefits of a College of Veterinary Medicine

Veterinary medical services provided by the CVM as well as by its graduates will generate indirect economic benefits to the community in the form of improved health and well-being of people and improved economic status of the people. Examples of veterinarians' contributions to human health include control of diseases transmissible from animals to man; increased supply of high-quality protein foods of animal origin; consumer protection through veterinary medical surveillance and assurance of wholesome, disease-free, and drug-free foods of animal origin; and veterinary research utilizing animals to evaluate efficacy and safety of drugs for human use. These examples, plus the educational opportunity for its citizens, support the concept that many of the benefits from a veterinary college are proportional to the population of the state.

Direct Economic Benefits of Veterinary Medical Services

Veterinarians are also responsible for the treatment, prevention, and control of animal diseases; thus they minimize economic losses attributable to diseases that cause death of animals or reduced meat, milk, and egg production. From 50 to 60 percent of the income from farm marketing is derived from animals and animal products. In the U.S., estimated annual losses from animal and poultry diseases and parasites exceeds $2.7 billion, or 15 percent of the potential production [5, p. 9]. The graduates of the proposed college will provide services which will prevent losses attributable to animal diseases, thus greatly enhancing the net income of animal owners.

General Economic Benefits to Host State

The proposed college is considered as an institution with many associated individuals and activities. Substantial revenues flow to the community and state as a direct result of the presence and purposes of the health complex of which the CVM becomes a part. The state in which the college will be located will receive direct economic benefits in various ways, among which are increased employment and increased revenue generated by payroll and college purchases.

The $19,600,000 construction money and the $4,185,000 operating funds, as calculated in Chapter 6, will be spent largely in the host state. While a portion of the funds will be spent out of state, the total effect of these expenditures in the host state on employment and revenue is amplified since increased expenditure by one individual will result in increased income to another who will spend at least part of this income, resulting in increased income to another, and so forth. This principle is a well-developed point in economics and is known as the

economic multiplier concept. Because of the diversity of the industrial and commercial economy of Massachusetts and the magnitude of its population, the income multiplier may be close to 2.5, as recommended by Paul Craig, Ph.D., noted economist at Ohio State University [6]. Since the multiplier effects can only be statistically estimated and not traced directly, a conservative estimate of 1.9 is used for this study [7 pp. 44-45].

Annual Direct Economic Benefits. In estimating increased personal income (revenue) in the host state due to operating expenditures of the veterinary college, the figure obtained is conservative because (a) in the fourth year of operation, the enrollment is estimated to be 386 (which excludes continuing education students) and does not represent subsequent expansion to the full enrollment level of 1114 students, and (b) only the personnel portion of the operating budget is used in calculations of expenditures in the host state. The salary portion of the operating budget is estimated to be 80% of $4,185,000 or $3,348,000 [8]. When an economic multiplier of 1.9 is applied to this figure, the annual increase in personal income due to the personnel salaries, a part of the operating budget, is estimated to be $6,361,200.

This added income will affect many segments of the state's economy. In its fourth year of operation, the new college should have 76 faculty and administrative personnel and 228 support staff personnel for a total of 304 employees. The effect of these employees on personal income, bank deposits, and retail sales in the host state is shown in Table 8.3.

TABLE 8.3 Annual Direct Economic Benefits to Massachusetts Resulting from Added Personal Income

Benefit to State	*Dollars per Employee*	*No. of Employees*	*Direct Benefits*	*Increased Revenue**
Faculty & Staff:				
Personal Income	$11,013	304	$3,348,000	$6,361,000
Bank Deposits**	$ 5,209	304	$1,584,000	$3,010,000
Retail Sales**	$ 6,006	304	$1,826,000	$3,469,000

*These figures reflect an economic multiplier of 1.9. Most incomes are not spent during the period in which they are earned. Since the income process is continuous, there is no obvious starting point. For purposes of analysis, however, it is useful to construct one. Households will ordinarily have for expenditure in the "present period" income claims already earned in a previous period. Therefore, these benefits are given as annual.

**Based on Economic Analysis and Study, *What New Jobs Mean to a Community,* U.S. Chamber of Commerce, 1973.

In addition to the benefits derived from personnel salaries and wages, an annual direct economic benefit will be provided by the students enrolled in the college of veterinary medicine. The average income (and expenditure) per student is estimated to be $6,000 [9]. This amount is multiplied by the estimated number of students in the fourth year of operation of the college,

which is 386 excluding continuing education students. Student expenditures may amount to $2,316,000; with an economic multiplier of 1.9, the students account for an estimated increase in income of $4,400,000. Information about the effect of student expenditures on bank deposits and retail sales is not analyzed.

The combined effect of faculty and staff salaries and student income is to increase income in the state by an estimated $10,761,000 annually.

One-Time Direct Economic Benefits. The cost of the veterinary college if constructed at the Worcester site is estimated at $19,600,000. Thirty-two percent of this cost figure may be attributable to labor [10, p. 200]. Based on 32 percent of the construction cost, a one-time personal income of $6,272,000 is calculated. When a 1.9 income multiplier is applied, a total income of $11,917,000 is projected.

Increased State Tax Revenue

The financial support provided by the host state will come largely from state tax revenue, and the increase in state tax revenue due to the CVM should be considered.

Although local Massachusetts governments also collect revenues, such as real estate taxes, automobile excise taxes, and fees for building permits and municipal licenses, they will incur added expenses in providing services for the college; therefore, their revenues will not be considered a benefit to the state.

The Commonwealth of Massachusetts obtains its revenue from taxes on the income of individuals, estates, and partnerships; from a corporation excise tax; from sales and use taxes; and from taxes on specified businesses and professions. Taxes levied against a number of other items in Massachusetts include room occupancy, alcoholic beverages, cigarettes, gasoline, insurance, bank income, utilities, franchises, pari-mutuel betting, real estate transfers, and inheritances. The major source of revenue is the personal income tax. The annual increase in state tax revenue from state income and sales taxes attributable to the CVM is shown in Table 8.4.

In this table, an economic multiplier of 1.9 is applied to the estimated taxes of faculty, support staff and students. All estimates in the table are made conservatively in order not to overstate the effects.

The total increase in annual state revenue is estimated to be $486,000. There will also be a one-time total taxable income of $11,929,000 (32% of construction cost X 1.9 as used previously) due to construction wages. If the same ratio of taxable income to personal income as that for the faculty and support staff is assumed (see Table 8.4), the following tax revenues are estimated: state income taxes – $456,000 and state sales taxes – $124,000 for a total of $580,000.

TABLE 8.4 Estimated Annual Increase in Massachusetts State Tax Revenue Attributable to the Proposed College

Faculty and Support Staff:			
INCOME TAX			
Personnel budget[a] (80% x 4,185,000 operating budget)	$3,348,000		
Exemptions based on $2600 deduction per 304 individuals[b]	790,400		
Taxable base for state income tax		$2,557,600	
State income tax at rate of 5%[b]			$127,880
SALES TAX			
Taxable base for combined state and federal income taxes	3,348,000		
State and federal income taxes at rate of 17%[b]	569,160		
Disposable personal income		2,778,840	
Deduct new savings deposits at rate of 7.5% of disposable personal income[c]		208,413	
Personal outlays (personal consumption expenditures)		2,570,427	
New retail sales excluding food, housing,[c] and clothing at rate of 45% of personal outlays		1,156,692	
State sales tax at rate of 3% of sales			34,701
All Students Except Continuing Education:			
INCOME TAX			
Income for 386 students at $6000[d]	2,316,000		
Exemptions based on $2600 per 386 individuals	1,003,600		
Taxable base for state income tax		1,312,400	
State income tax at rate of 5%[b]			65,620
SALES TAX			
Taxable base for combined state and federal income taxes	2,316,000		
State and federal income taxes at rate of 12.5%	289,500		
Disposable personal income		2,026,500	
No net increase in savings deposits assumed		—	
Personal outlays (personal consumption expenditures)		2,026,500	
New retail sales excluding food, housing,[c] and clothing at rate of 45% of personal outlays		911,925	

Table 8.4 (cont.)

State sales tax at rate of 3% of sales		27,358
State tax revenue from faculty, support staff, and all students except continuing education		255,559
Total increase in state revenue including multiplier effects at 1.9 income multiplier,[e] assuming the taxation rate on the multiplier effects is the same as that on the original expenditures (1.9 x 255,559)	State Revenue Total	$485,562

[a]80% of operating budget is used for personnel at Ohio State University, 1973-74.

[b]"State Sales and Use Tax Rates" and "State Income Tax Rates and Exemptions: 1972," *The Official Associated Press Almanac 1973,* New York Almanac Publishing Company, Inc., 1972.

[c]*What New Jobs Mean to a Community,* Economic Analysis & Study, Chamber of Commerce of the U.S., Washington, D.C., 1973; and "Methodology," Ohio Department of Economic and Community Development, Columbus.

[d]Estimate of minimum living expenses for a married professional student, Ohio State University Student Financial Aids Office, 1973.

[e]Caffrey, John & Herbert H. Isaacs, *Estimating the Impact of a College or University on the Local Economy,* American Council on Education, Washington, D.C., 1971.

Intangible Economic Benefits

There are many economic benefits received by the host state that are difficult to quantify. There is no single index of measured impact. The assessment is complex because of qualitative variables, some of which can be quantified only in dimensions other than dollars. College personnel render uncompensated services on task forces and committees. Numerous public services that go with a library resource will be utilized as the college becomes a part of the distinguished center of higher education in the area. Visitors will be drawn to the campus, thus boosting the economy. These include the visitor for business reasons; the recreational visitor, as one attending a scientific exhibit; the educational visitor, as a seminar participant; and the personal visitor, as a parent or prospective student.

As a part of a health complex, the college should be influential in attracting tax-paying residents into the state. Research organizations which may benefit from association with a medical complex may also relocate in the area and thus enhance the development of technology.

Summary of Economic Benefits

A brief analysis of the economic benefits of a regional college of veterinary medicine indicates that the benefits to Massachusetts are substantial. These are summarized in Table 8.5.

TABLE 8.5 Summary of Economic Benefits to Massachusetts

	Salaries & Wages			*Estimated Salary & Wage Benefit*		*Tax Revenue*	
Funds	*One Time*	*Annual*	*Economic Multiplier*	*One Time*	*Annual*	*One Time*	*Annual*
Construction	$6,279,000		1.9	$11,929,000		$580,000	
CVM Faculty & Staff		$3,348,000	1.9		$6,361,000		$309,000
CVM Students		2,316,000	1.9		4,400,000		177,000
Total Economic Benefits	$6,279,000	$5,664,000		$11,929,000	$10,761,000	$580,000	$486,000*

*Tax revenue for a period of 10 years escalated at 6% annually = $6,406,000
Tax revenue, one time = 580,000
Total for 10 years = $6,986,000

Direct Economic Benefits (In addition to tax revenue above):
(1) Increased income of animal breaders and producers

Indirect Economic Benefits:
(1) Improved health and well-being of people
(2) Improved economic status of people
(3) Educational opportunity for citizenry

Intangible Economic Benefits:
(1) Library resources
(2) Visitors, such as seminar participants
(3) Attractions of health complex
(4) Service activities of faculty
(5) Enhancement of technology

SPECIAL CONTRIBUTION OF MASSACHUSETTS

Consideration of the preceding economic factors suggests a greater burden of financial responsibility be borne by the state in which the college of veterinary medicine is to be located. It is recognized that the host state will benefit economically; however, this benefit to Massachusetts is offset by the value of the contributions of the Commonwealth (hereafter synonymous with state) of Massachusetts summarized in Table 8.6.

TABLE 8.6 Special Contributions by Massachusetts Over a Period of Ten Years

Item	*One-Time Contribution*	*Annual Contribution*	*Total*
Sharing of Facilities and Equipment	$3,002,722		
Land	3,500,000[1]		
Power Plant and Utilities	1,259,568[2]		$7,762,290
Overhead*			
1st Year		$527,263	
2nd Year		558,899	
3rd Year		592,433	
4th Year		627,979	
5th Year		665,657	
6th Year		705,597	
7th Year		747,933	
8th Year		792,809	
9th Year		840,377	
10th Year		890,800	6,949,747
10 Year Total			$14,712,037

*Escalation factor of 6% annually, National Institutes of Health, Bureau of Health Manpower Education.

[1]Land allocable to the College of Veterinary Medicine (350 acres at an appraised value of $10,000/acre).

[2]Calculated by allocating to the College of Veterinary Medicine its proportional share of the capital cost of the power plant at the University of Massachusetts Medical School.

It should be noted that over a ten-year period the recurring state tax revenue accruing to Massachusetts is $6,406,000 (local taxes not included) while the recurring contribution of overhead is $6,949,747. This small difference is probably more than offset by the direct, indirect, and intangible economic benefits which have not been quantified.

BASIS FOR FUNDING

The development of equitable formulas for state participation in funding the proposed college of veterinary medicine requires the consideration of many factors, particularly student space allocations, benefits of the college to the host state, and ability of states to pay. Separate formulas were developed for capital (construction) costs and for the cost of operation of the college and of movable equipment. Funding of the CVM by the seven states will require that a legal basis be established.

A regional college constructed in one state raises the question as to whether each of the other six states can legally finance capital costs for educational facilities located in another state. If a legally sound plan is developed, it is anticipated that each of the seven states will participate in the capital and other costs of an interstate veterinary college. According to advice received by NEBHE from the Attorneys General of four of the seven states, there are no constitutional barriers in their states to participation in a regional college of veterinary medicine. Opinions from the three remaining Attorneys General are in preparation or will be requested when authorizing legislation is filed. Authorization and appropriation legislation would be required, however, for provision of capital and operating funds.

Seven states are more likely to fund the college in a cooperative effort if their participation is equitable. The analysis of student space allocation plans resulted in a recommendation that the spaces be allocated in proportion to the state population. Data on the population, revenue, and per capita income of each state were studied to assess the financial capability of each state to participate. Table 8.1 presented earlier ranks the states according to population and shows the positive correlation between population and annual revenue. New Jersey, Massachusetts, and Connecticut rank first, second, and third, respectively, in population; and second, third, and first, respectively, in per capita income. Maine and Rhode Island rank in the mid-range in population and revenue, and New Hampshire and Vermont rank in the lowest in these categories. Maine, ranking fourth in population, fifth in revenue and last in per capita income, does not fall clearly in either the mid- or low group. These data were considered in deriving alternate formulas for participation of the seven states in funding both capital and operating requirements. Shared funding based upon population proved to be unequivocally most equitable and easiest to administer; therefore, the *state population plan* is selected for presentation.

Formula for Capital Funding

Capital funds represent a large but one-time requirement which, if shared equitably, will reflect the relative benefits to each state as well as the state's financial capacity.

State Population Plan for Construction Costs. It is recommended that each of the seven states shall contribute its part of the cost of construction based on its population. In this manner, the cost of the new college amounts to approximately $1.00 for each state resident and thus would not place an undue burden on any one state. The contributions of each state based on construction costs of $19,600,000 (including fees) are shown in Table 8.7.

TABLE 8.7 Maximum Estimated State Contributions for Construction Costs*

State	*Revenue***	*Population*	*Percent of Total Population*	*Maximum Estimated State Contribution*
N.J.	$2,116,000,000	7,168,164	37.8	$7,408,800
Mass.	2,159,000,000	5,689,170	29.9	5,860,400
Conn.	1,091,000,000	3,032,217	15.9	3,116,400
Me.	349,000,000	993,663	5.2	1,019,200
R.I.	379,000,000	949,723	5.0	980,000
N.H.	193,000,000	737,681	3.9	764,400
Vt.	237,000,000	444,732	2.3	450,800
Total	$6,524,000,000	19,015,350	100.0	$19,600,000

*Federal and private sources not included. The Comprehensive Health Manpower Training Act of 1971 authorizes up to 80 percent as the federal share of construction costs of a new veterinary college; the amount of federal funds which will be released between 1975 and 1978 is unknown. Non-state funds obtained for construction will decrease proportionately the contribution from each state.

***The American Almanac, The Statistical Abstract of the U.S.,* 93rd Ed., Bureau of the Census.

Formula for Operational Funding and Initial Movable Equipment

Operational funds must be guaranteed to assure stability of the college. Overhead costs, also referred to as indirect costs, should be borne by the host state to offset the economic benefit accruing to the state. These costs constitute 12.6% of the annual operating budget [11]. All other costs (such as salaries, wages, equipment replacement, supplies, travel, and printing) should be equitably shared by the seven states. In addition, initial movable equipment is a one-time cost at the time construction is completed. A plan for providing annual funding at the time four classes are in operation and for one-time initial movable equipment is given here.

Before the level of state contributions toward operating costs can be calculated it is essential to estimate the non-state appropriated income. Although primary funding of the proposed college will be derived from state appropriations, a significant portion of the operating income is expected from non-state sources described in Chapter 7. Table 8.8 presents the estimated income from tuition, fees, professional services, and federal grants and contracts. Tuition, identical to that for medical students on the same campus, is estimated at $1200

TABLE 8.8 Estimated Sources of Income for Operation in the Fourth Year

Total operating costs		$3,658,000
Estimated income (non state)		
Tuition[1]	$343,200	
Fees[2]	90,000	
Professional services[3]	85,000	
Federal grants and contracts		
education[4]	352,840	
research and other[5]	160,000	
Less total non-state income		$1,031,040
Total state appropriations		$2,626,960

[1]Tuition for 286 professional and graduate students @ $1200 estimated for 1981.

[2]600 continuing education students; 3 days at $50/day.

[3]Veterinary Teaching Hospital, ambulatory and diagnostic fees.

[4]The Comprehensive Health Manpower Training Act of 1971 authorized capitation grants up to $1750 for each full-time professional student plus $700 for each professional student in a new College of Veterinary Medicine. The actual level of federal funds which will be released in 1981 is unknown. The fiscal 1973 award to the College of Veterinary Medicine at The Ohio State University was $1,378.28 per professional student. ($1,378.28 x 256 = $352,840).

[5]Grant support is expected to increase in future years after a favorable reputation is established.

per year for 1981 when the veterinary college is expected to be in its fourth year of operation. Fees for 600 part-time students in continuing education is estimated to generate $90,000 annually. Revenue from professional services (rendered by the veterinary teaching hospital, ambulatory service and diagnostic laboratory) will be minimal during the early years but in future years should greatly exceed the conservative estimate of $85,000 during the fourth year of operation.

The levels of federal funds which may be authorized, appropriated and released in 1981 are highly speculative. Therefore, a conservative estimate of federal grants totalling $352,840 for education and $160,000 for research and services is based upon experience of existing veterinary colleges with federal agencies in 1972–73.

Total operating costs of $3,658,000 for the fourth year of operation less $1,031,040 from non-state sources leaves $2,626,960 to be appropriated by the participating states.

State Population Plan for Operational Costs. It is recommended that each state contribute a prorated share of operating and initial equipment costs based on population estimates of the U.S. Bureau of the Census. Subsequently, the appropriation by each state will be adjusted according to changes in the population. Each state's contribution for its share of the $2,626,960 operating costs and the $2,675,000 initial movable equipment costs is shown in Table 8.9. The $527,263 overhead costs are to be assumed by the host state.

TABLE 8.9 Estimated State Contributions for Movable Equipment and Fourth Year Operating Costs

State	Percent of Total Population	4th Year Operating	Initial Movable Equipment
N.J.	37.8	$ 992,991	$1,011,528
Mass.	29.9	785,461	800,124
Conn.	15.9	417,687	425,484
Me.	5.2	136,602	139,152
R.I.	5.0	131,348	133,800
N.H.	3.9	102,451	104,364
Vt.	2.3	60,420	61,548
Total	100.0	$2,626,960	$2,676,000

Advantages of State Population Plan

The three most significant advantages of this plan are considered to be the following:

1. Each state's contribution is proportional to its population and number of student places in the college.
2. Each of the three states with relatively large state revenue and high per capita income contribute more than each of the four states with lower state revenue and lower per capita income; therefore, this plan considers the states' financial capabilities.
3. The immediate and future annual economic benefit to Massachusetts of locating the college in that state will, to a great extent, be counterbalanced by the substantial contribution by Massachusetts to the college: land, shared facilities and equipment, power plant and utilities, and indirect costs, totalling approximately $14.7 million over the first ten years of the life of the college.

RECOMMENDATIONS

Because it is assumed that an adequate number of spaces will exist in the college for all interns, residents, graduate students, technical students, and continuing education students who are residents of the seven states and wish to enroll, no space allocation formula is necessary for these levels of students. Since a high positive correlation exists between state population, and the number of qualified residents in the region who apply for admission to a veterinary college, this study (29) RECOMMENDS that each state be allocated veterinary student spaces in the same proportion that the population of each state is to the total seven-state population.

Health and economic benefits of a veterinary college and its graduates to the

citizens and the financial capability of the states are directly proportional to the population; therefore, this study (30) RECOMMENDS that each of the seven states contribute its part of the cost of construction based on its population as reported in the official population estimate of the U.S. Bureau of the Census. Further, in order to assure stability of the college, this study RECOMMENDS that each state contribute a prorated share of movable equipment and operating costs based on its population. The cost of the college thus will not place an undue burden on any one state.

Increased tax revenue, as well as indirect and intangible economic benefits, accrue to the state in which the regional college is located. These economic benefits should be offset by the value of contributions made by the host state to the college. Therefore, this study (31) RECOMMENDS that Massachusetts provide the land, share facilities and equipment of the University of Massachusetts Medical School, and contribute the overhead costs for operation of the college.

A regional college constructed in one state raises the question of whether each of the other six states can legally finance capital costs for educational facilities located in another state. According to advice received by the New England Board of Higher Education from the Attorneys General of four of the seven states, there are no constitutional barriers in their states to participation in a regional college of veterinary medicine. Opinions from the three remaining Attorneys General are in preparation or will be requested when authorizing legislation is filed. Authorization and appropriation legislation would be required, however, for provision of capital and operating funds.

This study (32) RECOMMENDS that uniform legislation authorizing the establishment of a regional college of veterinary medicine be introduced into the seven state legislatures. This study further RECOMMENDS that by July 1974 such legislation be passed and that each state appropriate its share, based on its population, of the $280,000 required for planning.

REFERENCES

1. Southern Regional Education Board, *SREB Regional Contract Program Manual,* Atlanta, Georgia, 1972.

2. *Survey of Current Business,* August, 1972.

3. Bureau of the Census, U.S. Department of Commerce, *The American Almanac, The Statistical Abstract of the U.S.,* 93rd Edition, New York, Grosset and Dunlap, Inc., 1973.

4. New England Board of Higher Education, *The Need for a College of Veterinary Medicine to Serve New England and New Jersey,* 1973.

5. Humphrey, Hubert H., Chairman, *Veterinary Medical Science and Human Health,* Washington, D.C., U.S. Government Printing Office, 1961.

6. Craig, Paul G., Economist and Professor of Public Administration, Ohio State University, Personal Communication, June, 1973.

7. Caffrey, John and Herbert H. Isaacs, *Estimating the Impact of a College or University on the Local Economy,* American Council on Education, Washington, D.C., 1971.

8. Ohio State University, Columbus, Ohio, Personal Communication, May, 1973.

9. Ohio State University Student Financial Aids Office, Estimate of minimum living expenses for a married professional student, May, 1973.

10. Godfrey, Robert Sturgis, Editor-in-Chief, *Building Construction Cost Data 1973,* 31st Edition, Robert Snow Means Company, Inc., Duxbury, Massachusetts, 1973.

11. Ohio State University, Columbus, Ohio, Percentage of College of Veterinary Medicine Operating Budget for Overhead, 1972-73.

APPENDICES

APPENDIX A

LETTERS FROM INSTITUTIONS DECLINING CONSIDERATION

BROWN UNIVERSITY
PROVIDENCE, R.I. 02912

THE PRESIDENT

January 22, 1973

Dear Mr. Ferguson:

Brown University is not interested in being considered as a potential site for a college of veterinary medicine. We would appreciate being kept informed about the progress of the study being conducted by the New England Board of Higher Education. We are also willing to assist in that study in whatever way may seem appropriate.

I should mention that Morris L. Povar, D.V.M., Associate Professor of Psychology and Medical Science, serves as Director of Animal Health in Brown University. I am quite sure he is available for advice and consultation on this matter if that may be beneficial to you. You may also want to address any inquiries or questions of a general nature to Dr. Pierre M. Galletti, Vice President (Biology and Medicine).

I look forward to hearing about the results of this study on the feasibility of a veterinary medical college.

Sincerely yours,

Donald F. Hornig

Mr. Alan D. Ferguson
Office of the Director
New England Board of Higher Education
40 Grove Street
Wellesley, Massachusetts 02181

DARTMOUTH COLLEGE
HANOVER · NEW HAMPSHIRE · 03755

VICE PRESIDENT AND
DEAN OF THE FACULTY

January 12, 1973

Dr. David M. Wax
Assistant Director
New England Board of
Higher Education
40 Grove Street
Wellesley, Massachusetts 02181

Dear Dr. Wax:

I am writing following your suggestion that I put on paper the comment I made to you when you called earlier this week.

I have reviewed the forms you sent to us regarding the nature of Dartmouth College as it might bear on the establishment of a college of veterinary medicine to serve the New England states and New Jersey. Let me say at the outset, I think it is a worthy objective and one which I shall follow with interest.

I did conclude that there is no liklihood at this stage that Dartmouth can formally participate in the establishment of this college. We are in the midst of reviewing our program in Medicine, and simultaneously searching for a new Dean of the Dartmouth Medical School who will replace Dr. Carleton Chapman, who announced his resignation last fall after serving six years as Dean of the School.

Therefore, as you suggested, I have elected not to prepare the information or return the forms to you since it will have little relevance to your deliberations.

Sincerely yours,

Leonard M. Rieser

LMR:bdr
cc: President Kemeny

OFFICE OF THE PRESIDENT TUFTS UNIVERSITY MEDFORD, MASSACHUSETTS 02155

January 25, 1973

Mr. Alan D. Ferguson
New England Board of
Higher Education
40 Grove Street
Wellesley, Massachusetts 02181

Dear Alan:

Thank you very much for your letter of January 3 concerning the need for a college of veterinary medicine in New England. I have shared your letter as well as the bulletin you sent to me entitled, "A Repprt on the Need for a College of Veterinary Medicine in New England" with my colleagues and while we do recognize the need for a college of veterinary medicine in New England, Tufts is not interested at this time in the establishment of a veterinary medical college.

We do appreciate being informed and would be interested in learning the progress of further developments in this area.

Sincerely,

Burton C. Hallowell

BCH:k

YALE UNIVERSITY
NEW HAVEN CONNECTICUT

OFFICE OF THE PRESIDENT

January 23, 1973

Alan D. Ferguson, Director
New England Board of Higher
Education
40 Grove Street
Wellesley, Massachusetts 02181

Dear Alan:

I have discussed your letter concerning the establishment of a college of veterinary medicine in New England with a number of people here. While we believe the development of such a college, perhaps at Storrs, would be a good thing, we cannot undertake that responsibility ourselves. However, we would like to be helpful if there are appropriate ways in which we could cooperate with this endeavor.

Sincerely,

KBjr:ps

APPENDIX B
CRITERIA RATING SCALES

Criteria	*Key Variables*	*Rating Scale*	*Data Source*
General Campus			
1. The institution is easily accessible to the entire region.	1. easy access (refers to geographic location in relation to other states involved)	1. 1 *Low* (Maine, N.J.) 2 *Med.* (Vermont, N.H.) 3 *High* (Mass., Conn., R.I.)	1. Map
2. The institution has demonstrated interest in having the proposed college.	2. demonstrated interest (studies have been performed or are under way/oral statements of leaders)	2. 1 *No* 3 *Yes* – studies have been performed, or – leaders have expressed interest or – mandates have been issued or – institutions were cooperative and provided material during the site visit	2. a. List of actual or proposed studies b. Legislative activity c. Rating on site visit
3. There is an adequate supply of potential companion animal patients.	3. adequate supply (8 small animal patients and 1 horse patient per senior student)	3. 1 *Low* 2 *Med.* 3 *High* Ratings based on comparison of numbers of potential companion animal patients for each candidate campus.	3. See Methods of Estimating Animal Patients for the College of Veterinary Medicine in supplement to this Appendix.
4. There is an adequate supply of potential food producing and zoo animal patients.	4. adequate supply (minimum of 3 mammal patients and 5 avian, marine, zoo, wildlife and other animal patients per senior student)	4. 1 *Low* 2 *Med.* 3 *High* Ratings based on comparison of numbers of potential food-producing and zoo animal patients for each candidate campus.	4. See Methods of Estimating Animal Patients for the College of Veterinary Medicine in supplement to this Appendix.

Criteria	*Key Variables*	*Rating Scale*			*Data Source*
5. There is adequate university owned land on campus that could be used for a college of veterinary medicine.	5. adequate acreage on campus	5. 1 *Low* fewer than 20 acres on campus	2 *Med.* 20-39 acres on campus	3 *High* 40 or more acres on campus	5. Questionnaire, p. 2, Item B.*
6. There is adequate university owned land adjacent to the campus that could be used for a college of veterinary medicine	6. adequate acreage adjacent to campus	6. 1 *Low* fewer than 50 acres	2 *Med.* 50-100 acres	3 *High* over 100 acres (or no land available but acreage in #7 is adequate)	6. Questionnaire, p. 2, Item B.
7. There is adequate land adjacent to the campus available for purchase that could be used by a veterinary college.	7. adequate acreage available for purchase	7. 1 *No* low or medium rating for #5 or #6 and no land available for purchase.		3 *Yes* land available for purchase (or no land available but acreage in #5 is adequate)	7. Questionnaire, p. 2, Item B.
8. The general terrain of the area is suitable for the proposed college.	8. suitable terrain (adequate drainage)	8. 1 *Low* low-swampy	2 *Med.* flat terrain, medium altitude	3 *High* high drainage potential, high altitude	8. a. Topographical maps b. Rating during site visit
9. The veterinary research farm will not be a nuisance to the surrounding area.	9. prevailing winds (effect on farm-associated odor and flies with regard to surrounding area)	9. 1 *No* the prevailing winds will create a problem		3 *Yes* the prevailing winds will not create a problem	9. Air Weather Service, U.S. Weather Bureau, U.S. Dept. of Commerce

*See Appendix C for a copy of the Questionnaire.

Criteria	*Key Variables*	*Rating Scale*				*Data Sources*
10. The institution is easily accessible to the entire region by air.	10. easy access (refers to distance of site from closest commercial airport)	10.	1 *Low* over 25 mi.	2 *Med.* 15-25 mi.	3 *High* less than 15 mi.	10. American Automobile Association
11. The housing supply is adequate for the needs of the veterinary student	11. adequate housing (refers to number of units for students)	11.	1 *No* the housing is inadequate (not enough provided by either private enterprise or the university).		3 *Yes* there is adequate housing provided by either private enterprise or the university.	11. Rating during site visit
12. The proposed site is easily accessible by auto.	12. easy access	12.	1 *No*		3 *Yes* – a freeway or good highway is nearby – little traffic congestion.	12. Rating during site visit
13. There is public transportation to and from the proposed site.	13. public transportation either currently available or proposed	13.	1 *No* public transportation unavailable		3 *Yes* inter-campus and other public transportation is available or will become available	13. Interview question during site visit
14. Distance from nearest existing veterinary college mediates against unnecessary overlap in functions.	14. distance from nearest veterinary college	14.	1 *No* institution is less than 150 mi. from closest existing veterinary college		3 *Yes* institution is 150 mi. or more from closest existing veterinary college	14. American Automobile Association

Criteria	*Key Variables*	*Rating Scale*				*Data Sources*
15. The existing library facilities can accommodate the veterinary medical students and faculty.	15. existing library facilities (sq. ft.) available to accommodate veterinary library	15.	1 *Low* 1-6,000 sq. ft.	2 *Med.* 6,001-16,000 sq. ft.	3 *High* over 16,000 sq. ft.	15. Questionnaire, p. 9, Item I, and p. 17, Item F
16. The institution has adequate support services to accommodate veterinary medicine.	16. adequate support services (refers to services such as – computer – power plant – student health services – recreation)	16.	1 *Low*	2 *Med.*	3 *High*	16. Interview question during site visit
			(one combined rating for all of the services listed)			
17. There is an existing or proposed and funded medical school on campus.	17. existence of medical school	17.	1 *No* No medical college exists nor is one proposed		3 *Yes* a medical college does or will exist	17. *The New American Guide to Colleges* or Directory of Institution
18. There is an existing agriculture college on campus.	18. existence of college of agriculture	18.	1 *No* does not exist		3 *Yes* exists	18. *The New American Guide to Colleges* or Directory of Institution
19. There is a college of pharmacy on the campus.	19. existence of pharmacy affiliation	19.	1 *No* does not exist		3 *Yes* exists	19. *The New American Guide to Colleges* or Directory of Institution
20. There is a college of dental medicine on campus.	20. existence of college of dental medicine	20.	1 *No* does not exist		3 *Yes* exists	20. *The New American Guide to Colleges* or Directory of Institution

Criteria	*Key Variables*	*Rating Scale*				*Data Source*
21. There is a division of public health or equivalent on the campus.	21. existence of division of public health	21.	1 *No* does not exist		3 *Yes* exists	21. *The New American Guide to Colleges* or Directory of Institution
22. There is a division of allied health sciences on the campus.	22. existence of allied health sciences	22.	1 *No* do not exist		3 *Yes* exist	22. *The New American Guide to Colleges* or Directory of Institution
23. There is legislative climate for support	23. legislative support (subjective opinion and documentation of previous and current legislation on veterinary medicine in each state).	23.	1 Low	2 Med.	3 High (rating determined subjectively)	23. Legislative activity
24. There is support by veterinarians	24. support	24.	1 *No*		3 *Yes* – if state is seeking political action, has established a commission – if state veterinary medical associations have actively sought a veterinary college – if veterinarians have independently investigated the possibility of establishing a school	24. Interviews during site visit and prior studies
25. There are other satellite facilities which could be used by the veterinary medical students. (example: New England Regional Primate Research Center, Northeastern Research Center for Wildlife Diseases, Veterans Hospital.	25. other satellite facilities available (number and quality)	25.	1 *Low* institutions having the lowest no. of quality satellite facilities	2 *Med.* institutions having medium no. of quality satellite facilities	3 *High* institutions having the highest no. of quality satellite facilities	25. Questionnaire, p. 8, Item H, and p. 15, Item C, plus interview question on site visit

Criteria	*Key Variables*	*Rating Scale*			*Data Source*
School of Medicine					
1. The research facilities are available for use by the veterinary college	1. available research facilities (number and type of facilities)	1. 1 *Low* no facilities available	2 *Med.* some facilities available	3 *High* all or most facilities available	1. Questionnaire p. 6, Item E plus interview question on site visit
2. The teaching facilities are available for use by the veterinary college	2. available non-clinical facilities (number and type of facilities)	2. 1 *Low* no teaching facilities available	2 *Med.* some facilities available	3 *High* all or most facilities available	2. Questionnaire p. 6, Item E plus interview question on site visit
3. The clinical facilities are available for use by the veterinary college	3. available clinical facilities (number and type of facilities)	3. 1 *Low* no clinical facilities available	2 *Med.* some facilities available	3 *High* all or most facilities available	3. Questionnaire p. 6, Item E plus interview question on site visit
4. The continuing education facilities are available for use by the veterinary college	4. available existing continuing education facilities (according to quality of existing program and availability to veterinary college)	4. 1 *Low*	2 *Med.*	3 *High*	4. Interview question on site visit
		(Determined by subjective opinion)			
5. The medical school has a division of laboratory animal medicine.	5. existence of division	5. 1 *No* does not exist		3 *Yes* exists	5. School of Medicine Bulletin or interview question during site visit
6. There is an effective biomedical research program.	6. effective biomedical research program in medical school (dollar value)	6. 1 *Low* lowest amt. of money spent for biomedical research 1971-72	2 *Med.* med. amt. of money spent for biomedical research 1971-72	3 *High* highest amt. of money spent for biomedical research 1971-72	6. Questionnaire p. 5, Item B

Criteria	*Key Variables*	*Rating Scale*			*Data Source*
7. There are human patients potentially available for veterinary medical student instruction.	7. availability of human patients (policy issue regarding reciprocity between human and animal medical students)	7. 1 *No* (Policy decision by Deans of candidate schools of medicine)		3 *Yes*	7. Deans, Schools of Medicine, obtained on site visit
8. There is a medical library with space available for the addition of veterinary medicine.	8. space available (sq. ft.)	8. 1 *Low* 1-6,000 sq. ft.	2 *Med.* 6,001-16,000 sq. ft.	3 *High* over 16,000 sq. ft.	8. Questionnaire, p. 9, Item I
Division of Laboratory Animal Medicine					
1. The division offers a wide range of services.	1. range of services (number offered)	1. 1 *Low* (1-3)	2 *Med.* (4-6)	3 *High* (7-8)	1. Questionnaire, p. 11, Item D
		Rating determined by number of services checked by each candidate on questionnaire.			
2. The services are available to many different organizations.	2. availability of services (number of organizations using the services)	2. 1 *Low* less than 2 of those listed	2 *Med.* 3 or 4 of those listed	3 *High* all that were listed	2. Questionnaire, p. 11, Item D
3. The division conducts research projects	3. research projects conducted (determined by number of FTE's of D.V.M. and dollars of funding	3. 1 *Low* 2 or less FTE's, below $50,000	2 *Med.* 3-6 FTE's, $50,000-300,000	3 *High* 7-8 FTE's, over $300,000	3. Questionnaire, p. 10, Item A, and p. 12, Item E
4. The division offers residency training for veterinarians in laboratory animal medicine.	4. residency training offered (determined by certificate granted)	4. 1 *No* no certificates granted		3 *Yes* certificates granted	4. Questionnaire, p. 13, Item F

Criteria	*Key Variables*		*Rating Scale*			*Data Source*
5. The division offers an animal technician training program.	5. animal technician training offered	5.	1 *No* does not offer program		3 *Yes* offers program	5. Questionnaire, p. 13, Item F
6. The division offers graduate courses leading to a degree	6. graduate credit leading to a degree offered	6.	1 *No* no graduate degrees are awarded		3 *Yes* graduate degrees awarded	6. Questionnaire, p. 13, Item F
7. There is an animal farm affiliated with the division.	7. animal farm with adequate acreage available	7.	1 *Low* no farm or farm with less than 100 acres	2 *Med.* farm with 100-200 acres	3 *High* farm with over 200 acres	7. Questionnaire, p. 13, Item G
College of Agriculture						
1. The college has a veterinary science department or equivalent.	1. existence of veterinary science department	1.	1 *No* does not have department or equivalent		3 *Yes* has department	1. a. *Guide to American Colleges* b. College catalogs
2. There is a library or portions of a library assigned to veterinary science.	2. existence of library or portions of one assigned to veterinary science	2.	1 *No* no veterinary library exists		3 *Yes* veterinary library exists or portions of it exist	2. Questionnaire, p. 22
3. There is an agricultural library with space available for the addition of veterinary medicine.	3. existing library space available to accommodate veterinary library (sq. ft.)	3.	1 *Low* 1-6,000 sq. ft.	2 *Med.* 6,001-13,000 sq. ft.	3 *High* over 13,000 sq. ft.	3. Questionnaire, p. 17, Item F

Criteria	*Key Variables*		*Rating Scale*			*Data Source*
4. The college has an agricultural experiment station.	4. existence of agricultural experimental station	4.	1 *No* does not exist		3 *Yes* exists	4. Questionnaire, p. 14, Item B
5. The college has a veterinary extension program	5. existence of veterinary extension program	5.	1 *No* does not exist		3 *Yes* exists	5. Questionnaire, p. 19, Items B and C
6. The college has a continuing education program for veterinarians.	6. existence of continuing veterinary education program	6.	1 *No* does not exist		3 *Yes* exists	6. Interview question on site visit
7. The college offers an animal technician training program.	7. existence of animal technician training program	7.	1 *No* does not exist		3 *Yes* exists	7. Questionnaire, p. 16, Item D.
8. The college has a division of laboratory animal resources to serve the entire university.	8. existence of division of laboratory animal resources	8.	1 *No* does not exist		3 *Yes* exists	8. Questionnaire, p. 16, Item D
9. There is an animal research farm affiliated with the university.	9. existence of animal farm and quality estimate by acres	9.	1 *Low* no farm or farm with fewer than 20 acres	2 *Med.* farm with 21-99 acres	3 *High* farm with over 100 acres	9. Questionnaire, p. 17, Item E
10. There is an effective biomedical research program.	10. existence of effective biomedical research program (determined by number of FTE's of D.V.M. and dollars of grants	10.	1 *Low* less than 2 FTE's below $200,000	2 *Med.* 2-8 FTE's $200,000 $500,000	3 *High* 9-12 FTE's, above $500,000	10. Questionnaire, p. 15

Criteria	*Key Variables*	*Rating Scale*		*Data Source*
Department of Veterinary Science				
1. The department offers a program in pre-veterinary medicine	1. existence of program in pre-veterinary medicine	1. 1 *No* does not exist	3 *Yes* exists	1. Questionnaire, p. 21, Item F
2. There is an existing M.S. program.	2. existence of M.S. program	2. 1 *No* does not exist	3 *Yes* exists	2. College catalogs
3. There is an existing Ph.D. program	3. existence of Ph.D. program	3. 1 *No* does not exist	3 *Yes* exists	3. College catalogs
4. There is an existing M.S. and Ph.D. program.	4. existence of an M.S. and Ph.D. program	4. 1 *No* both programs do not exist	3 *Yes* both programs exist	4. College catalogs
5. The department offers a residency program.	5. existence of residency program	5. 1 *No* does not exist	3 *Yes* exists	5. Questionnaire, p. 21, Item G
6. The department offers an internship program.	6. existence of internship program	6. 1 *No* does not exist	3 *Yes* exists	6. Questionnaire, p. 21, Item G
7. The department offers a residency and internship program.	7. existence of both a residency and internship program.	7. 1 *No* does not exist	3 *Yes* exists	7. Questionnaire, p. 21, Item G

Criteria	*Key Variables*		*Rating Scale*			*Data Source*
8. The department operates a stage diagnostic laboratory.	8. existence of department operated state diagnostic center (quality estimate as determined by FTE D.V.M.'s)	8.	1 *Low* no center	2 *Med.* center with fewer than 6 FTE's	3 *High* center with 6-12 FTE's	8. Questionnaire, p. 15, Item C
9. There is an effective extension-diagnostic service program.	9. effective extension diagnostic service program (dollar value)	9.	1 *Low* lowest amount of money spent for vet. research 1971-72	2 *Med.* med. amount of money spent for vet. research 1971-72	3 *High* highest amt. of money spent for vet. research 1971-72	9. Questionnaire, p. 19, Item C
10. There is an effective veterinary research program.	10. effective veterinary research program (dollar value)	10.	1 *Low* lowest amt. of money spent for program 1971-72	2 *Med.* med. amt. of money spent for program 1971-72	3 *High* highest amt. of money spent for program 1971-72	10. Questionnaire, p. 19, Item C

SUPPLEMENT TO APPENDIX B

METHODS OF ESTIMATING ANIMAL PATIENTS FOR THE COLLEGE OF VETERINARY MEDICINE

The methods of estimating potential animal patients varied somewhat depending on the information available for each particular type of animal patient. The specific methods are summarized below.

Horses

Service Area – State in which potential college site is located.

Horse Population – The horse population was taken for each state [1]

Ratio of Patients to Horse Population – Number of patients at Ohio State University Veterinary Hospital [2] divided by horse population of Ohio [3]. This ratio is 0.0163.

Dogs and Cats

Service Area – County in which potential site is located.

Animal Population

Dogs: Average number of dogs per person in state [4] multiplied by county population [5].

Cats: Average number of cats per person in state [4] multiplied by county population [5].

Ratio of Patients to Animal Population

Dogs: Number of patients at Ohio State University Veterinary Hospital [2] divided by number of dogs in Franklin County, Ohio [6]. This ratio is 0.0131.

Cats: Number of patients at Ohio State University Veterinary Hospital [2] divided by number of cats in Franklin County, Ohio [4]. This ratio is 0.078.

Food-Producing Animals (Cattle, Pigs and Sheep)

Service Area – County in which potential site is located except that in the cases where the site was very close to the county boundary, both counties were used. Tolland and Windham Counties were used for Storrs, Connecticut; Franklin and Hampshire Counties were used for Amherst, Massachusetts; and Middlesex and Somerset Counties were used for both New Jersey sites.

Animal Population

Cattle: Numbers taken for each county [3].

Pigs and Sheep: The number of pigs in each county were added to number of sheep in each county [3].

Ratio of Patients to Animal Population

Cattle: Number of patients at Ohio State University Veterinary Hospital [2] divided by the cattle population in Franklin County, Ohio [3]. This ratio is 0.075.

Pigs and Sheep: Number of patients at Ohio State University Veterinary Hospital [2] divided by the population of pigs and sheep in Franklin County, Ohio [3]. This ratio is 0.0042.

Poultry

Service Area – The same service areas were used for poultry as for food-producing animals (either one or two counties).

Animal Population – The poultry population was taken for each county [3].

Ratio of Patients to Poultry Population

Since poultry patients are not normally brought into the veterinary hospital, there was insufficient information available to establish a ratio of patients to poultry population. Therefore, the projected ratio of poultry per senior year veterinary medical student was computed for each potential site. Similarly, the ratio of poultry population in Franklin County, Ohio, to the number of senior year veterinary medical students at Ohio State University was computed [3].

Zoo Animals

Service Area – State in which potential college site is located.

Animal Population – The numbers of animals listed for all zoos within each state were summed [7].

Ratio of Patients to Zoo Animal Population

There was insufficient information for computing the ratio of patients to zoo animal population. The projected ratio of zoo animals to senior year veterinary medical students for each prospective site was computed. Similarly, the ratio of zoo animals in the state of Ohio to senior year veterinary medical students at Ohio State University was computed [7].

REFERENCES

1. Table A-5, The New England Board of Higher Education, *The Need for a College of Veterinary Medicine to Serve New England and New Jersey*, Wellesley Massachusetts, 1973.

2. "Veterinary Hospital Summary Data Sheet," Columbus, Ohio, 1972.
3. *1969 U.S. Census of Agriculture.*
4. *Animal Control Survey,* The American Humane Association, 1971.
5. *1970 U.S. Census.*
6. Humane Society, Columbus, Ohio.
7. *The Animals Next Door, A Guide to Zoos and Aquariums of the Americas,* 1971.

APPENDIX C
QUESTIONNAIRES

1

NEW ENGLAND BOARD OF HIGHER EDUCATION

INFORMATION NEEDED FOR A STUDY ON THE FEASIBILITY OF ESTABLISHING A COLLEGE OF VETERINARY MEDICINE TO SERVE THE NEW ENGLAND STATES AND NEW JERSEY

GENERAL UNIVERSITY INFORMATION

Name of University _____ Address _____

A. *General Information*

President _____

Vice-president(s)	Title or responsible area

B. (Please complete the following table.

Total acreage owned by University ——

	Acreage Potentially a Site for College of Veterinary Medicine	*Number of Acres*	*Distance from Campus*	
			Miles	*Min. by Auto*
University Owned	Land on Campus			
	Land Adjacent to Campus up to 100 acres			
Publicly or Privately Owned	Land up to 100 acres Adjacent to Campus & Potentially Available for Purchase			

C. *Housing*

	Number of Units Presently Available			*Number of Units Available in 1978*		
	Dorms	Apartments	Houses	Dorms	Apartments	Houses
Accommodations for up to 400 Professional Veterinary Students						
Accommodations for 50 Graduate Students in Veterinary Medicine						

D. *Addenda*

Include copy of the following:

1. Master Plan
2. Fiscal Report, 1 July 1971 – 30 June 1972
3. Annual Report of the university 1971-1972
4. Map of university showing:
   existing facilities
   facilities currently under construction
   planned and funded facilities
   planned facilities (unfunded)
   potential sites for a College of Veterinary Medicine

NEW ENGLAND BOARD OF HIGHER EDUCATION

INFORMATION NEEDED FOR A STUDY ON THE FEASIBILITY OF ESTABLISHING A COLLEGE OF VETERINARY MEDICINE TO SERVE THE NEW ENGLAND STATES AND NEW JERSEY

ORGANIZATION FOR ADMINISTRATION OF RESEARCH

Name of University _____ Address _____

A. *General Information*

Name of Organization _____

Director _____

Assistant Director(s)

_____

_____

B. *Funding* 1 July 1971 – 30 June 1972

	Amount			
	Grants	*Contracts*	*Gifts*	*Total*
Biomedical	$	$	$	$
Agricultural Research	$	$	$	$
All other areas	$	$	$	$
Total	$	$	$	$

C. *Addendum*

Please attach latest copy of Annual Report on research for the university.

NEW ENGLAND BOARD OF HIGHER EDUCATION

INFORMATION NEEDED FOR A STUDY ON THE FEASIBILITY OF ESTABLISHING A COLLEGE OF VETERINARY MEDICINE TO SERVE THE NEW ENGLAND STATES AND NEW JERSEY

COLLEGE OF MEDICINE

Name of University_____ Address _____

A. *General Information*

Dean _____

Associate or Assistant Deans	Areas of responsibility
_____	_____
_____	_____
_____	_____
_____	_____

Faculty – please give number of professional personnel in full-time equivalents:

Professors (FTE) _____

Associate Professors (FTE) _____

Assistant Professors (FTE) _____

Instructors (FTE) _____

Student/faculty ratio _____

B. *Expenditures* 1 July 1971 – 30 June 1972 (exclude capital improvement)

	Program			
	M.D.	*Graduate Degree*	*Continuing Education*	*Allied Health Professions*
Total expenditures for Education	$	$	$	$

Total expenditures for Research $_____

C. *Major Sources of Income* 1 July 1971 – 30 June 1972 (exclude income for construction)

Income	*Education*	*Research*	*Service*
State Appropriations and Grants	$	$	$
Federal Grants	$	$	$
Foundations	$	$	$
Earnings	$	$	$
Other	$	$	$
Total	$	$	$

D. *Students*

Enrollment in these programs:

	1971–72	*1972–73*	*Expected enrollment in 1978*
M.D.			
M.S.			
Ph.D.			
Interns			
Residents			
B.S.			
Continuing Education			

Costs

Total cost for educating one medical student from admission to awarding M.D. degree $_____.

State basis for computation of the above figure _____

_____

_____

E. *Facilities*

Name of building	*Net square feet*	*Net square feet utilized for*		
		Teaching	*Research*	*Clinical*

F. *Teaching Hospitals*

Number of Attending Staff (FTE) _____

Number of Courtesy Staff (FTE) _____

Number of Limited Staff (FTE)
(Post M.D. Students and Fellows) _____

Total number of beds _____

G. *Departments in the College*

	Name of department	Name of chairman
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____
9.	_____	_____
10.	_____	_____

8

H. *Non-University Facilities Used in Connection with the School of Medicine*

Facility	*Name*	*Location*
Hospitals		
State Research Labs		
Federal Research Labs		
Industrial Research Labs		
Other		

9

I. *Medical Library*

Space utilization

Total net area _____ square feet

Space currently available for adding Veterinary Medicine _____ square feet

Space available in 1978 for adding Veterinary Medicine _____ square feet

General Information

Librarian _____

Number of staff (full time equivalents) _____

Number of books (1971-72) _____

Number of bound journals _____

Number of journal subscriptions (1971-72) _____

Number of microtexts (1971-72) _____

Expenditures

Total expenditures (1 July 1971 – 30 June 1972) $_____

10

DIVISION OF LABORATORY ANIMAL MEDICINE OR EQUIVALENT

Name of university _____ Address _____

A. *General Information*

Director _____

Faculty Classification	*Number FTE who are veterinarians*	*Number FTE who are not veterinarians*
Professors		
Associate Professors		
Assistant Professors		
Instructors		
Residents		
Other		

Number of Technical Staff _____

Number of Office Staff _____

B. *Expenditures*

1 July 1971 – 30 June 1972

	Personnel	*Operating*	*Capital improvement*	*Equipment*
Amount	$	$	$	$

C. *Revenue*

1 July 1971 – 30 June 1972

Sources of Revenue Amount

_____ $ _____

_____ $ _____

_____ $ _____

D. *Services*

Services provided by this division (please check)

_____ Production of research animals

_____ Purchase of research animals

_____ Housing and care for research animals

_____ Consultation – selection, diagnosis and use of research animals

_____ Consultation – planning new animal housing and research facilities

_____ Diagnosis, control, treatment of disease

_____ Preventive medicine

_____ Public relations work on lab animal use

_____ Other (specify)

What organizations utilize the above services?

_____ College of Medicine

_____ College of Agriculture

_____ College of Biological Sciences

_____ University at large

_____ Community at large

_____ Other (specify)

Animal census (1 July 1971 – 30 June 1972)

	No. purchased	*No. bred and reared*		*No. purchased*	*No. bred and reared*
Mice			Dogs		
Rats			Cats		
Hampsters			Sheep		
Guinea Pigs			Goats		
Rabbits			Horses		
Gerbils			Pigs		
Degus			Primates		
Other Species			Birds		
(specify)			Frogs		
			Fish		

E. *Research* 1 July 1971 – 30 June 1972

Name of research projects in your division	*Source of funds*	*Annual amount of award*
1.		$
2.		$
3.		$
4.		$
5.		$
	Total	$ _____

F. *Educational Programs in the Division*

Name of program	*Number enrolled*		*Expected enrollment*	*Name of degree*	*Name of certificate*
	1971–72	*1972–73*	*1978*		
Laboratory animal medicine					
Animal technician					
Other (specify)					

List graduate courses offered by your division

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

G. *Facilities*

Animal farm in number of acres _____

Other facilities

Facility	*Net square feet*
Research labs	
Service areas	
Instruction	
Administrative	
Animal housing	
Total	

NEW ENGLAND BOARD OF HIGHER EDUCATION

INFORMATION NEEDED FOR A STUDY ON THE FEASIBILITY OF ESTABLISHING A COLLEGE OF VETERINARY MEDICINE TO SERVE THE NEW ENGLAND STATES AND NEW JERSEY

COLLEGE OF AGRICULTURE (OR EQUIVALENT) QUESTIONNAIRE

Name of University_____ Address _____

A. *General Information*

Dean _____

Associate or Assistant Deans	Areas of responsibility
_____	_____
_____	_____
_____	_____
_____	_____

Please check the degree(s) you offer in the College of Agriculture:

B.S. _____ Ph. D. _____

M.S. _____ Other (describe)_____

Number of students enrolled in the College of Agriculture:

Freshmen	_____	Seniors	_____
Sophomores	_____	Graduates	_____
Juniors	_____	Technical	_____

Number of students indicating a pre-veterinary medicine major _____

B. *Agricultural Experiment Station*

Do you have an agricultural experiment station at your university?

_____ yes

_____ no

If answer is yes, please describe your animal and poultry research program pertaining to the following:

	Number of FTE investigators				*Expenditures 1 July 1971 through 30 June 1972 (exclude capital improvements)*
	animal		*poultry*		
	D.V.M.	*Ph.D.*	*D.V.M.*	*Ph.D.*	
Physiology					
Nutrition					
Reproduction					
Diseases of animals					
Other animal and poultry					
Total					

C. *Diagnostic Laboratories*

Is there a state diagnostic laboratory or branch in your area? yes ____ no ____

If yes, please answer the following:

Location _____

Number of accessions 1 July 1971 30 June 1972	*Number of staff*			*Expenditures 1 July 1971 30 June 1972 (exclude capital improvement)*
	D.V.M.	*Ph.D.*	*Technical*	
Poultry				$
Animals				$
Total				$

If there are other diagnostic laboratories in the state, please attach the above information for each.

D. *Educational Programs*

Do you have an animal technician training program within the university?

yes _____ no _____

Do you have a division of laboratory animal resources to serve the entire university?

yes _____ no _____

Educational programs in the divisions of laboratory animal resources.

Name of program	*Number enrolled*		*Expected enrollment*	*Name of degree*	*Name of certificate*
	1971-72	*1972-73*	*1978*		
Laboratory animal medicine					
Animal technician					
Other (specify)					

Are there community junior colleges or other institutions in your state offering an animal technician program?

yes _____ no _____

If so, please complete the following table.

Location	*Enrollment in Animal Technology or equivalent*			*Name of Degree*
	1971-72	*1972-73*	*Expected in 1978*	

E. *Facilities in the Division of Laboratory Animal Resources*

Animal farm in number of acres _____

Other facilities

Facility	*Net square feet*
Research labs	
Service areas	
Instruction	
Administrative	
Animal housing	
Total	

F. *Agriculture Library*

Space utilization

Total net area _____ square feet

Space currently available for adding Veterinary Medicine _____ square feet

Space currently available in 1978 for adding Veterinary Medicine _____ square feet

General Information

Librarian _____

Number of staff (full-time equivalents) _____

Number of books (1971-72) _____

Number of bound journals (1971-72) _____

Number of journal subscriptions (1971-72) _____

Number of microtexts (1971-72) _____

Expenditures

Total expenditures (1 July 1971 – 30 June 1972) $ _____

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DEPARTMENT OF VETERINARY SCIENCE, ANIMAL PATHOLOGY, OR EQUIVALENT

Name of University _____ Address _____

A. *General Information*

Do you have a Department of Veterinary Science or Animal Pathology or equivalent?

yes _____ no _____

If yes, please give the following information on your department:

Name of department _____ Name of chairman _____

Faculty Classification	*Number FTE who are veterinarians*	*Number FTE who are not veterinarians*
Professors		
Associate Professors		
Assistant Professors		
Instructors		
Residents		
Other		

Number of Technical Staff _____

Number of Office Staff _____

B. *Facilities*

Describe the facilities assigned to the Veterinary Science Department.

Land _____ acres

Buildings _____

Please attach additional sheets using the following form to describe room utilization.

19

Name of room	*Net square feet*			
	Teaching	*Research*	*Veterinary extension*	*Service*
Examples: (teaching laboratory, animal room, faculty office, immunology laboratory, etc.)				

C. *Expenditures* 1 July 1971 – 30 June 1972

	Teaching	*Research*	*Extension*	*Diagnostic service*	*Other*
Amount	$	$	$	$	$

D. *Revenue* 1 July 1971 – 30 June 1972

Sources of Revenue — Amount

_____ $ _____

_____ $ _____

_____ $ _____

_____ $ _____

_____ $ _____

E. *Curriculum*

Please outline the curriculum for pre-veterinary medical students.

Required courses	*Credit hours*	*Elective courses*	*Credit hours*
Total		Total	

F. *Pre-Veterinary Medicine Students*

	Enrollment		
	1971-72	*1972-73*	*Expected 1978*
Total number of pre-veterinary students			

Number of pre-veterinary students who applied for admission to a College of Veterinary Medicine for the academic year 1971-72 _____

Number accepted _____

Number of pre-veterinary students who fulfilled all of the requirements for admission to a College of Veterinary Medicine for the academic year 1971-72. _____

G. *Residency or Internship*

Do you have a residency or internship program? yes _____ no _____

If yes, please complete this table.

	Years duration	*Fields of specialization*
Intern		
Resident		

H. *Research*

List research projects in the Veterinary Science Department during 1971-72.

Titles of Research Projects	*Number of FTE personnel*				*Budget 1 July 1971 – 30 June 1972*
	Professional			*Clerical & Technical*	
	D.V.M.	*Ph.D.*	*M.S.*		
1.					
2.					
3.					
4.					

I. *Programs*

Please check which of these programs are offered by the College of Agriculture and indicate expenditures for the period 1 July 1971 – 30 June 1972.

		Expenditures 1 July 1971 – 30 June 1972		
	Offered	Teaching	Research	Other
Wildlife diseases	_____	$_____	$_____	$_____
Wildlife ecology	_____	$_____	$_____	$_____
Wildlife management	_____	$_____	$_____	$_____
Marine animals (fisheries, etc.)	_____	$_____	$_____	$_____

J. *Veterinary Science Library*

Space utilization

Total net area _____ square feet

Space currently available for adding Veterinary Medicine _____ square feet

Space available in 1978 for adding Veterinary Medicine _____ square feet

General information

Librarian _____

Number of staff (full-time equivalents) _____

Number of books (1971-72) _____

Number of bound journals (1971-72) _____

Number of journal subscriptions (1971-72) _____

Number of microtexts (1971-72) _____

Expenditures

Total expenditures (1 July 1971 – 30 June 1972) $_____

(This same format was used for collecting information from Schools of Pharmacy and Dental Medicine and Divisions of Public Health)

NEW ENGLAND BOARD OF HIGHER EDUCATION

INFORMATION NEEDED FOR A STUDY ON THE FEASIBILITY OF ESTABLISHING A COLLEGE OF VETERINARY MEDICINE TO SERVE THE NEW ENGLAND STATES AND NEW JERSEY

ALLIED HEALTH PROFESSIONS QUESTIONNAIRE – GENERAL

Name of University_____ Address _____

A. *General Information*

Dean _____ College, School or Department _____

Associate or Assistant Deans

_____

_____

Number of faculty (FTE) _____ Student/faculty ratio _____

B. *Expenditures* 1 July 1971 – 30 June 1972 (exclude capital improvement)

Total expenditures for Education $_____

Total expenditures for Research $_____

C. *Revenue* 1 July 1971 – 30 June 1972

Sources of Revenue	Amount
_____	$_____
_____	$_____
_____	$_____
_____	$_____
_____	$_____

D. *Facilities*

Building	*Net square feet*	*Net square feet utilized*		
		Teaching	*Research*	*Clinical*

E. *Departments*

Please list all departments in your college.

1. _____ 5. _____

2. _____ 6. _____

3. _____ 7. _____

4. _____ 8. _____

F. *Enrollment*

Student enrollment 1971-72.

Number of students	*Program*
	M.S.
	Ph.D.
	Post Doctoral (or equivalent)
	Continuing Education
	Professional Degree (specify)

APPENDIX D
SITE VISIT PERSONNEL

Visited* February 1973

Connecticut

1. Carl F. Hinz, Jr., M.D.
   Associate Dean, Undergraduate Medical Education
   University of Connecticut
   School of Medicine

2. Edwin J. Kersting, D.V.M.
   Dean, College of Agriculture
   University of Connecticut

3. James Leming
   Assistant Vice-President – Facilities
   University of Connecticut
   School of Medicine

4. Robert U. Massey, M.D.
   Dean, College of Medicine
   University of Connecticut

5. John G. Rohrbach, B.S.
   Assistant Vice-President for Financial Affairs
   University of Connecticut

6. Dwight Wadsworth
   Director, Physical Plant
   University of Connecticut
   School of Medicine

Massachusetts

1. Thomas W. Fox, Ph.D.
   Head, Department of Veterinary and Animal Sciences
   University of Massachusetts

2. Richard H. Saunders, Jr., M.D.
   Associate Dean for Academic Affairs
   University of Massachusetts
   School of Medicine

*Project Personnel Who Visited All Sites

David M. Wax, Ph.D.
Clarence R. Cole, D.V.M., Ph.D.
LaVerne Knezek, Ph.D.

3. Russell E. Smith, V.M.D.
   Professor of Veterinary and Animal Sciences
   College of Agriculture
   University of Massachusetts

4. Lamar Soutter, M.D.
   Dean, College of Medicine
   University of Massachusetts

5. Arless A. Spielman, Ph.D.
   Dean, College of Food and Natural Resources
   Director of the Experiment Station and the
   Extension Service
   University of Massachusetts

6. Douglas Stern, V.M.D.
   Professor of Veterinary and Animal Sciences
   University of Massachusetts

New Jersey

1. Harry Barbee
   Assistant to Richard Durbin
   Vice-President of Planning
   College of Medicine and Dentistry of New Jersey

2. Stanley S. Bergen, Jr., M.D.
   President
   College of Medicine and Dentistry of New Jersey

3. Harry E. Bessley
   Housing
   Rutgers University

4. Charles E. Hess
   Dean
   College of Agriculture and Environmental Science
   Rutgers University

5. John McCoy, V.M.D.
   Director of Vivarium
   Rutgers Medical School

6. James W. MacKenzie, M.D.
   Dean
   College of Medicine and Dentistry of New Jersey
   Rutgers Medical School

7. Richard H. Merritt, Ph.D.
   Director of Resident Instruction
   Rutgers University
   College of Agriculture and Environmental Sciences

8. John Mixner, Ph.D.
   Chairman, Department of Animal Sciences
   Rutgers University

9. Robert J. Robinson, M.D.
   Associate Dean for Research
   Rutgers Medical School

10. James A. Rogers, M.D.
    Assistant Professor of Preventive Medicine and
    Community Health
    New Jersey Medical School

11. David C. Tudor, V.M.D.
    Research Professor in Poultry Pathology
    College of Agriculture and Environmental Sciences
    Department of Animal Sciences
    Rutgers University

12. Edward Wilkins
    Campus Planner
    Rutgers University

13. William Zemen, V.M.D.
    Director of Animal Care
    New Jersey Medical School

APPENDIX E

DATA COMPILATION AND FINAL RATINGS

CAMPUSES WITH A SCHOOL OF MEDICINE*

Criteria	*University of Connecticut Farmington Campus*	*University of Massachusetts Worcester Campus*	*Rutgers Medical School Piscataway*
GENERAL CAMPUS CRITERIA			
1. The institution is easily accessible to the entire region.	High – centrally located for other six states (10.5)	High – centrally located for other six states (10.5)	Low – not centrally located for other six states (3.5)
2. The institution has demonstrated its interest in having the proposed college.	The Medical School was planned with no consideration of incorporating veterinary medicine. There is no visible interest by the school's representatives in having a college of veterinary medicine. A state legislative resolution was presented in 1972 to create a commission to study the feasibility of establishing a college of veterinary medicine in New England to serve the citizens of the six New England states. The proposed commission was to work with NEBHE in this effort.	In 1946, Board of Trustees voted to build veterinary college at U. of Mass. when funds became available. In 1964, a Mass. veterinarian approached Dean Soutter on subject of creating a veterinary medical college along with medical school. The matter was studied with help from AAMC and visits to two veterinary colleges. Bills were introduced to state legislators for several years. The Dean of the Medical School provided many materials on the site visit and was very cooperative in all respects. The School of Medicine incorporated plans for a school of veterinary medicine in its plans for the future.	Assemblyman Robinson is introducing a bill to the N.J. legislature to conduct a feasibility study on establishing a veterinary college. President Bergen of the College of Medicine and Dentistry of N.J. stated that if N.J. were chosen for the site, he would make every effort to implement it and make it a top-flight school. "Veterinary Medical Service in N.J. and Need for Veterinary Medical Education" formed a part of the revised draft of the Health Professions Education Master Plan (HPEMP) for N.J., to be discussed by the Board of Higher Education in April, 1973. Preparation for site visit was limited except for excellent cooperation by Div. of Laboratory Animal Medicine. Some requested materials were ready. Interest did not appear to be high. (6.2)
	(4.9)	(11.1)	

*Final ratings shown in parentheses. See Chapter 5 for an explanation of how the final ratings were derived.

Criteria	*University of Connecticut Farmington Campus*		*University of Massachusetts Worcester Campus*		*Rutgers Medical School Piscataway*	
3. There is an adequate supply of potential companion animal patients.	Dog and cat patients needed for county	768	Dog and cat patients needed for county	768	Dog and cat patients needed for county	768
	Potential dog patients in co.	1,090	Potential dog patients in co.	860	Potential dog patients in co.	492
	Potential cat patients in co.	5,260	Potential cat patients in co.	4,170	Potential cat patients in co.	4,000
	Total	6,350	Total	5,030	Total	4,492
	Horse patients needed for state	96	Horse patients needed for state	96	Horse patients needed for state	96
	Potential horse patients in state	650	Potential horse patients in state	374	Potential horse patients in state	534
	(12.9)		(12.9)		(12.9)	
4. There is an adequate supply of potential food producing and zoo animal patients.	Large mammal patients needed for county(ies)	288	Large mammal patients needed for county(ies)	288	Large mammal patients needed for county(ies)	288
	Potential patients in area	1,027	Potential patients in area	1,902	Potential patients in area	761
	Poultry [county(ies)] and zoo (state) population needed per student	827	Poultry [county(ies)] and zoo (state) population needed per student	827	Poultry [county(ies)] and zoo (state) population needed per student	827
	Poultry and zoo population in area per student	6,659	Poultry and zoo population in area per student	8,391	Poultry and zoo population in area per student	3,379
	(9.6)		(10.9)		(5.5)	
5. There is an adequate supply of university owned land on campus that could be used for a college of veterinary medicine.	None available		128 acres, which includes a 47 acre portion used by the medical school complex; it includes a medical science building with a hospital.		90 acre Newman Farm, owned by the Board of Trustees of Rutgers University	
	(3.7)		(11.1)		(11.1)	

6. There is an adequate supply of university owned land adjacent to the campus that could be used for a college of veterinary medicine.	None available (3.7)	Adequate supply on campus (11.1)	1. Unused military camp (Camp Kilmer) 500 acres 2. 90 acre area adjacent to the Newman Farm (9.9)
7. There is an adequate supply of land adjacent to the campus available for purchase that could be used by a veterinary college.	100 acres, $30,000 per acre (6.2)	1. Adjacent to 128 acres, another 250 acres 2. 1100 acre Grafton State Hospital; state owned, hospital is in the process of being phased out so land is available for some other use. – This land is a part of the constituency of the chairman of the ways and means committee. – Could be used for the research farm (11.1)	Adequate supply on campus and adjacent to campus (8.6)
8. The general terrain of the area is suitable for the purposes of the new college.	100 acres available for purchase. This area has a limited amount of high terrain and is very wet. It is sloping with an underlayer of peat moss.	1. 128 acre site. This area is gently sloping and well drained. There is medium soil. 2. 250 acres adjacent to 128 acres. The land is rolling, well drained, with medium soil. 3. 1100 acre Grafton State Hospital. The land is tillable; there are some good pastures. There are two good silos, some laboratories for research, and some barn-type structures.	1. 90 acre Newman Farm. The land is gently sloping, with excellent elevation in relation to the surrounding buildings. Good soil for landscaping. It is adjacent to the Medical School, the library, the Nelson biology facility, the psychiatric institute and the university apartments. 2. 500 acre Camp Kilmer. It is well drained and sloping; consists of shale. Poor land for pasture. It is close to Livingston College. Zoning may be a problem because of flies and odor.

Criteria	*University of Connecticut Farmington Campus*	*University of Massachusetts Worcester Campus*	*Rutgers Medical School Piscataway*
			3. 90 acres adjacent to Newman Farm is gently sloping with excellent elevation. (9.6)
	(3.2)	(9.6)	
9. The veterinary research farm will not be a nuisance to the surrounding area.	The mean wind rate for Bradley Field indicates yearly prevailing winds as 15%-S, 12.7%-NW, and 11.7%-N. The land located west of the Health Center which may be purchased for vet. college and campus may become a slight nuisance. Wind from the farm site although over hilly and wooded terrain is moving 25.4% of the time in direction of Health Center.	The proposed farm is an 1100 acre site at Grafton. Poultry and livestock production has been an activity on this farm since the early part of this century and has proven to be no nuisance to the surrounding area. The central location of the barns and pastures provides for an adequate barrier between potential nuisance and adjacent areas.	Livingston College would be the recipient of nuisance because the prevailing wind is SW and next is W, both of which would make the research farm at the Kilmer site less than optimal. The Kilmer site is also a vast area for expansion of Livingston College and other future developments of Rutgers University.
	(4.9)	(11.1)	(3.7)
10. The institution is easily accessible to the entire region by air.	Nearest major airport is Hartford-Springfield Airport, Bradley Field Driving time, 15 minutes; 11 miles	Worcester Municipal Airport (James D. O'Brien Field) is four miles west of downtown Worcester Major airport is in Boston Driving time, 47 minutes; 39 miles	Nearest airport, Newark Driving time 45 minutes; 30 miles
	(12.6)	(4.2)	(12.6)
11. The housing is adequate for supplying the needs of the veterinary student.	There is no housing available and little chance for expansion. The proximity to Hartford may help in housing faculty and staff, but it is not known if there is low-cost housing for students. Private builders are expected to provide only minimal housing.	There are plans for apartments near the medical center. Private enterprise provides housing in the general Worcester area.	Housing is a problem and of low priority because of finances. There are two private enterprise developments close by, but other land adjacent to the university is not available for purchase either by private enterprise or the university.
	(2.7)	(7.2)	(2.7)

12. The proposed site is easily accessible by auto.	The 100 acre site available for purchase has good access. (12.6)	1. The 128 acre site is surrounded by good roads and there are some other roads under construction. 2. The 1100 acre site is an 11 minute drive from the medical school. Rt. 9, close to the site, is a direct route to Boston via the Massachusetts turnpike. A vast network of interstate routes converge in the Worcester area. (12.6)	1. The 90 acre Newman Farm is surrounded by major roads; little if any congestion. 2. The Camp Kilmer site is four miles from the New Brunswick agriculture school but 30-60 minutes driving time due to the congestion. 3. 90 acres adjacent to Newman Farm is surrounded by major roads; little if any congestion. (11.2)
13. There is public transportation to and from the proposed site.	None available (2.5)	Bus transportation to campus is possible from several locations, but is limited in some respects. (3.3)	Rutgers has an intra-university bus system (from N. Brunswick to Piscataway), but medical school has no system of buses. Personal car used by medical students and faculty. (3.3)
14. The institution is far enough away from the existing veterinary colleges so that there is no unnecessary overlap in functions.	196 miles away from Philadelphia (Penn. Veterinary College) Driving time: three hours, 55 minutes (8.4)	265 miles from Philadelphia (Penn. Veterinary College) Driving time: five hours, 18 minutes (8.4)	51 miles from Philadelphia (Penn. Veterinary College) Driving time: one hour (2.8)
15. The existing library facilities can accommodate the veterinary medical students and faculty.	No, there is only 90 sq. ft. out of a total 11,400 sq. ft. available for veterinary medicine. (3.7)	Yes, 39,925 sq. ft. – to be completed in 1973. 19,648 sq. ft. of total is available for veterinary medicine. (11.1)	The existing library is already overloaded by medical student use. (3.7)

Criteria	*University of Connecticut Farmington Campus*	*University of Massachusetts Worcester Campus*	*Rutgers Medical School Piscataway*
16. The institution has adequate support services to accommodate veterinary medicine.	Institution has the following support services computer power plant (7.0)	Institution has or is in the process of developing the following support services computer (leased from Amherst) recreation student health power plant (10.8)	Institution has the following support services computer recreation student health (4.8)
17. There is an existing or proposed and funded medical school on the campus.	Yes	Yes	Yes
18. There is an existing agriculture college on the campus.	No	No	No
19. There is a college of pharmacy on the campus.	No (2.3)	No (2.3)	Yes (6.9)
20. There is a college of dental medicine on the campus.	Yes (5.1)	No (1.7)	No (1.7)
21. There is a division of public health or equivalent on the campus.	No (2.6)	No (2.6)	No (2.6)
22. There is a division of allied health sciences on the campus.	No (2.9)	No (2.9)	No (2.9)

23. There is legislative climate for support.	State Legislative Resolution, 1972, to set up commission to study feasibility of New England school (regional). The proposed commission was to work with NEBHE in this effort. (4.7)	In 1946, Bd. of Trustees voted to build veterinary college when funds became available. A Legislative Resolution was proposed, March, 1972, to study feasibility of establishing veterinary school within the U. of Mass. – with first two years at Worcester Medical School and last two years in Berkshire Co. There was a bill introduced to the Massachusetts General Assembly in March, 1973, to allow Grafton State Hospital to be used for veterinary medicine. (12.5)	"Veterinary Medical Service in N.J. and the Need for Veterinary Medical Education" formed a part of the revised draft of the Health Professions Education Master Plan (HPEMP) for N.J. and was scheduled for discussion at April, 1973, meeting of the Board of Higher Education. Assemblyman Robinson is to introduce a bill to the N.J. legislature to conduct a feasibility study for establishing a veterinary college. (9.4)
24. There is support by veterinarians.	Veterinarians in Conn. active for over 20 yrs. now support New England school through New Eng. Vet. Med. Assoc. After the president of the U. of Conn. decided not to use an appropriated $2.5 million in the late 60's, the veterinarians of Conn. requested a visit by Dean Soutter of the U. of Mass. Medical School to consider Massachusetts undertaking such a school. (8.8)	In 1964, veterinarians went to Dean Soutter at Worcester about school. In 1965, Mass. Vet. Assoc. voted unanimously in favor of creating a school. In 1971, Mass. veterinarians introduced a legislative bill to create a school at the University of Mass., Worcester. Dr. Stern, extension veterinarian and professor of veterinary science, said veterinarians are interested and want a vet. school anywhere. Public interest 20 years. (13.2)	Veterinarians in N.J. Vet. Med. Assoc. are active. (7.3)

Criteria	*University of Connecticut Farmington Campus*	*University of Massachusetts Worcester Campus*	*Rutgers Medical School Piscataway*
25. There are other satellite facilities which could be used by the veterinary medical students. (Example: New England Primate Center, New England Wildlife Center, Veterans Hospital).	See Appendix F. (10.2)	See Appendix F. (5.7)	See Appendix F. (7.9)
Total Rating – General Campus Criteria	(145.7)	(197.9)	(150.8)
SCHOOL OF MEDICINE CRITERIA			
1. The research facilities are available for use by the veterinary college.	Lab. animal medicine facilities (small animal resource) could be used by veterinary college. No other space available for veterinary medicine use. (7.0)	Lab. animal medicine is in the developmental stages; could be used by veterinary college when it is instituted. The hospital is available for some veterinary research insofar as hospital policy permits. (11.2)	Lab. animal medicine facilities (small animal resource) could be used by veterinary college. No other space available for veterinary medicine use. (7.0)
2. The teaching facilities are available for use by the veterinary college.	The veterinary students may be able to sit in on a lecture now and then, but there are really no facilities available for veterinary use.	The veterinary students would be able to use some of the medical students' laboratories and lecture halls (3 of 175 seat capacity) on a temporary basis through careful scheduling, but the veterinary college would have to build its own facilities.	There may be some space for advanced or Ph.D. students, but there is no space for DVM student use.

	(4.1)	There are plans to build a 1,000 seat medical school auditorium which could be used by the veterinary college on a permanent basis. (10.3)	(5.5)
3. The clinical facilities are available for use by the veterinary college.	A veterinary student could come into the facilities but would have to obtain permission. (4.4)	No space available (3.3)	No space available (3.3)
4. The continuing education facilities are available for use by the veterinary college.	The facilities can be used by the veterinary college. There will be television hookups for continuing education in two hospitals in the future. There is a plan for a continuing education link extending to all associated hospitals in the area (link also proposed for undergraduate education). There is also a microwave bill before the legislature. (9.9)	The facilities can be used by the veterinary college. Continuing education is being planned in conjunction with other schools. A dean for continuing education will be employed. (11.1)	The facilities can be used by the veterinary college. The lab. animal medicine sponsored a course in surgery for the academy of veterinary surgeons. Continuing education is going into the community hospitals. The university also sponsors seminars. Part of the cont. educ. program of the N.J. Vet. Med. Assoc. and the N.J. Animal Hospital Attendants Assoc. and periodically the N.Y.-Delaware branch of the Am. Assoc. of Lab. An. Science are held at the medical school. (9.9)
5. The medical school has a division of laboratory animal medicine.	Yes (11.1)	No – there is a division in the planning stage. (11.1)	Yes (11.1)
6. There is an effective biomedical research program.	$1,678,814 (11.7)	$200,000 (3.9)	$1,229,931 (7.8)

Criteria	*University of Connecticut Farmington Campus*	*University of Massachusetts Worcester Campus*	*Rutgers Medical School Piscataway*
7. There are human patients potentially available for veterinary medical student instruction.	Participation in grand rounds is acceptable. Some areas are off limits to veterinary students. (7.2)	Yes (8.1)	Would not be available except in the most unusual circumstances. (9.1)
8. There is a medical library with space available for the addition of veterinary medicine.	90 sq. ft. currently available (4.0)	Yes, library only needs to add collection of material for veterinary medicine. 39,925 sq. ft. – to be completed in 1973. 19,648 sq. ft. of total is available for veterinary medicine. (12.0)	There is no space for addition of veterinary medicine. (4.0)
Division of Laboratory Animal Medicine			
1. The division offers a wide range of services.	Yes →offers seven different services. (11.1)	Under development (8.6)	Yes – eight different services. (11.1)
2. The services are available to many different organizations.	Offers to two organizations: the college of medicine and the university at large. (4.1)	Under development (4.1)	Offers to six organizations: the school of medicine, the school of dental medicine, the biology departments, the Institute of Microbiology, the Center for Alcohol Studies, Bureau of Biological Research (4.1)
3. The division conducts research projects.	One veterinary FTE No research or funds listed (3.9)	Under development (3.9)	One veterinary FTE No research or funds listed (3.9)

4. The division offers residency training for veterinarians in laboratory animal medicine.	No (3.9)	Under development (6.5)	No (3.9)
5. The division offers an animal technician training program.	No (2.7)	No plans for development (2.7)	No – but offers laboratory animal medicine technical training. (3.6)
6. The division offers graduate courses leading to a degree.	No (3.4)	No plans for development (3.4)	Yes – offers graduate course (pharmacological toxicology) but no degree is offered in laboratory animal medicine. It also conducts orientation programs in animal care including anesthesiology and x-ray positioning and techniques for third year medical students. (4.5)
7. There is an animal farm affiliated with the division.	No (3.9)	Under development (6.5)	No (3.9)
Total Rating – School of Medicine Criteria	(92.4)	(106.7)	(92.7)

CAMPUSES WITH A COLLEGE OF AGRICULTURE*

Criteria	*University of Connecticut Storrs Campus*	*University of Massachusetts Amherst Campus*	*Rutgers University New Brunswick Campus*
GENERAL CAMPUS CRITERIA			
1. The institution is easily accessible to the entire region.	High – centrally located for other six states (10.5)	High – centrally located for other six states (10.5)	Low – not centrally located for other six states (3.5)
2. The institution has demonstrated its interest in having the proposed college	Capital planning for a college of veterinary medicine has extended over a period of years. In 1957, Capital Planning Funds were authorized by the General Assembly. This facility was never funded. The adm. under the president's leadership considered the college of low priority and decided not to proceed. Since then, however, a new administration expressed interest to the New England Board. In 1967, the General Assembly approved a request of $2,000,000 for a facility for the Dept. of Animal Diseases. The Univ. has sited the facility to insure available area for a future veterinary college. In 1969, with the encouragement of the Board of Trustees and the Governor, the General Assembly voted planning funds of $250,000.	In 1946, Board of Trustees voted to build veterinary college at U. of Mass. when funds became available. Some of the administrators said that if a veterinary college were established with medical school, it would be of higher priority. A legislative resolution was presented in 1972 to study the feasibility of establishing a veterinary college within the U. of Mass. Douglas Stern, V.M.D., extension veterinarian and professor of veterinary science, is the veterinarian on legislative commission. The Dean and other personnel were cooperative on site visit, but generally reflected attitude of low priority for a college of veterinary medicine.	Assemblyman Robinson is introducing a bill to the N.J. legislature to conduct a feasibility study on establishing a veterinary college. Oral interest was expressed by Edward Cohen, Director, Office of Health Professions Education, Dept. of Higher Education, N.J. "Veterinary Medical Service in N.J. and Need for Veterinary Medical Education" formed a part of the revised draft of the Health Professions Education Master Plan (HPEMP) for N.J. to be discussed by the Board of Higher Education in April, 1973. Preparation for site visit was limited.

*Final ratings shown in parentheses. See Chapter 5 for an explanation of how the final ratings were derived.

A state legislative resolution was presented in 1972 to create a commission to study the feasibility of establishing a college of veterinary medicine in New England to serve the citizens of the six New England states. The proposed commission was to work with NEBHE in this effort.

Dean E. J. Kersting of the College of Agriculture and Natural Resources has been designated by the president to be responsible for assisting NEBHE in this study. He has seriously considered institutional planning for potential sites for the veterinary college and animal research farm and cooperated in all requests for data.

(11.1)

3. There is an adequate supply of potential companion animal patients.

Dog and cat patients needed for county	768
Potential dog patients in co.	137
Potential cat patients in co.	646
Total	783
Horse patients needed for state	96
Potential horse patients in state	650

(5.7)

(8.6)

Dog and cat patients needed for county	768
Potential dog patients in co.	167
Potential cat patients in co.	811
Total	978
Horse patients needed for state	96
Potential horse patients in state	374

(7.2)

(7.4)

Dog and cat patients needed for county	768
Potential dog patients in co.	492
Potential cat patients in co.	4,000
Total	4,492
Horse patients needed for state	96
Potential horse patients in state	534

(12.9)

Criteria	*University of Connecticut Storrs Campus*	*University of Massachusetts Amherst Campus*	*Rutgers University New Brunswick Campus*
4. There is an adequate supply of potential food producing and zoo animal patients.	Large mammal patients needed for county(ies) 288 Potential patients in area 2,332 Poultry [county(ies)] and zoo (state) population needed per student 827 Poultry and zoo population in area per student 25,868 (12.3)	Large mammal patients needed for county(ies) 288 Potential patients in area 2,011 Poultry [county(ies)] and zoo (state) population needed per student 827 Poultry and zoo population in area per student 2,810 (10.9)	Large mammal patients needed for county(ies) 288 Potential patients in area 761 Poultry [county(ies)] and zoo (state) population needed per student 827 Poultry and zoo population in area per student 3,379 (5.5)
5. There is an adequate supply of university owned land on campus that could be used for a college of veterinary medicine.	100 acres on campus beside College of Agricultural and Environmental Science. (11.1)	1. 65 acres (formerly reserved for Medical School) in the northeast area of the campus. 2. 30 acres by poultry, large animal isolation, and veterinary science buildings in the northwest area of the campus – There is the possibility of a new highway being built adjacent to this area. If it is not, the acreage could be extended; if it is, the 30 acres are of little value as a site for veterinary medicine. Both sites already have some research activities; part of these resources could be utilized for research in veterinary medicine. (11.1)	1. 35 acres on campus next to the animal husbandry area. 2. 100+ acres near the beef barns on the edge of the campus. (11.1)

6. There is an adequate supply of university owned land adjacent to the campus that could be used for a college of veterinary medicine.	120 acre pathobiology research farm (11.1)	Adequate supply on campus. Possibility of also using Deerfield Farm 200+ acres available for research in veterinary medicine. (11.1)	Adequate supply on campus (11.1)
7. There is an adequate supply of land adjacent to the campus available for purchase that could be used by a veterinary college.	Adequate supply on campus and adjacent to campus (11.1)	Adequate supply on campus and adjacent to campus (11.1)	Adequate supply on campus (11.1)
8. The general terrain of the area is suitable for the purposes of the new college.	1. 100 acres on campus. Has good drainage potential. Altitude high, good soil. Able to support construction and landscaping. 2. 120 acres pathobiology research farm. Drainage is adequate and will support construction and landscaping and has existing facilities for large research animals and poultry. (9.6)	1. 65 acres, Northeast site. This area is sloping, thus having good drainage potential. The altitude is high and the soil is good. 2. 30 acre, Northwest site. This area is low, flat, with good soil. (6.4)	1. 35 acre area near animal husbandry. This area is flat with good soil and is near the College of Agriculture. 2. 100+ acres near beef barn. This area has good soil, able to support landscaping. It is sloping toward the highway. Both of these sites are conveniently close to each other. (8.5)
9. The veterinary research farm will not be a nuisance to the surrounding area.	The pathobiology research farm located 2 miles from the campus has ongoing research programs on diseases of food animals and has proven not to be a nuisance to the surrounding areas. Present developments in the area suggest that this site for the research farm will not be a nuisance in the future. (11.1)	The proposed research farm is located NE of the center of the Amherst campus. The prevailing winds according to the Air Weather Service are from the N, S, NW. Therefore, the proposed site should not be a nuisance. (11.1)	The beef farm site would not be a nuisance because prevailing winds are in direction of ornamental research farm, Helyar's wood, and environmental research farm. Water drainage is in the general NE direction into Mill Pond, which will reach city water supply and may be an undesirable feature. (9.9)

Criteria	*University of Connecticut Storrs Campus*	*University of Massachusetts Amherst Campus*	*Rutgers University New Brunswick Campus*
10. The institution is easily accessible to the entire region by air.	Nearest airport is Hartford-Springfield Airport, Bradley Field Driving time, 30 minutes; 25 miles (5.6)	Nearest airport, Hartford-Springfield Airport, Bradley Field Driving time, 60 minutes; 30 miles (4.2)	Nearest airport, Newark Driving time 25 minutes; 21 miles (8.4)
11. The housing is adequate for supplying the needs of the veterinary student.	Private enterprise is intended to take care of married students and faculty. There is no excess of dormitory space and future plans have low priority. (5.4)	Little housing problem; the housing is developed on the periphery of the campus. There is a small complex of apartments for married students. Private enterprise takes care of most of the student housing. (8.1)	The university could not provide housing for 400 students on or off campus because there are no university plans for housing construction and no housing is provided by private enterprise. The cost of construction is also very high. (2.7)
12. The proposed site is easily accessible by auto.	1. The 100 acre site is within walking distance to all campus facilities. 2. The 120 acre research farm is two miles and eight minutes driving time away from campus. (12.6)	1. The 65 acre site is surrounded by roads; there is little traffic congestion. 2. The 30 acre Northwest site has good auto access. (12.6)	Both sites are accessible because there is a freeway and highways, but both are heavily congested. (5.6)
13. There is public transportation to and from the proposed site.	There is a shuttle bus system with two buses every seven minutes (for both sites). (7.5)	There is an intrauniversity bus running at 10 minute intervals. (7.5)	There is an intracampus bus system and an intercampus bus system (from one Rutgers campus to another). (6.7)
14. The institution is far enough away from the existing veterinary colleges so that there is no unnecessary overlap in functions.	238 miles away from Philadelphia (Penn. Veterinary College) Driving time: four hours, 46 minutes (8.4)	260 miles from Philadelphia (Penn. Veterinary College) Driving time: five hours, 12 minutes (8.4)	59 miles from Philadelphia (Penn. Veterinary College) Driving time: one hour, 11 minutes (2.8)

15. The existing library facilities can accommodate the veterinary medical students and faculty.	The existing library facilities are not adequate for the university. There is a new four to six million dollar library planned, but no money has been appropriated. The library could provide only general library services for the veterinary college. (3.7)	A new library is in the process of being constructed, but the completion date is unknown. There is not now nor will there be space for veterinary medicine. The college could use the general library services. (3.7)	The main campus library is not located on the agriculture college campus. (3.7)
16. The institution has adequate support services to accommodate veterinary medicine.	Institution has the following support services computer recreation student health power plant (10.8)	Institution has the following support services computer recreation student health power plant (10.8)	Institution has the following support services computer recreation student health (4.8)
17. There is an existing or proposed and funded medical school on the campus.	No	No	No
18. There is an existing agriculture college on the campus.	Yes	Yes	Yes
19. There is a college of pharmacy on the campus.	Yes (6.9)	No (2.3)	No (2.3)
20. There is a college of dental medicine on the campus.	No (1.7)	No (1.7)	No (1.7)

Criteria	*University of Connecticut Storrs Campus*	*University of Massachusetts Amherst Campus*	*Rutgers University New Brunswick Campus*
21. There is a division of public health or equivalent on the campus.	No (2.6)	Yes (7.8)	No (2.6)
22. There is a division of allied health sciences on the campus.	No (2.9)	No (2.9)	No (2.9)
23. There is legislative climate for support.	About 1968 the Conn. Legislature voted $2,500,000 to build a veterinary school at Storrs along with the Dept. of Animal Pathology which was already there. Subsequently, Pres. Babbidge of the University gave the money to the Board of Community Colleges. Since then, however, Acting Pres. Gant expressed interest to the New England Board. State Legislative Resolution, 1972, to set up commission to study feasibility of New England school (regional). The proposed commission was to work with NEBHE in this effort. (14.1)	In 1946 Board of Trustees voted to build veterinary college when funds became available. State Department of Agri. and Department of Public Health are aware of need for D.V.M.'s. (7.8)	"Veterinary Medical Service in N.J. and the Need for Veterinary Medical Education" formed a part of the revised draft of the Health Professions Education Master Plan (HPEMP) for N.J. and was scheduled for discussion at April, 1973, meeting of the Board of Higher Education. Assemblyman Robinson is to introduce a bill to the N.J. legislature to conduct a feasibility study for establishing a veterinary college. (9.4)
24. There is support by veterinarians.	Veterinarians in Conn. active for over 20 yrs. now support N.E. school through New Eng. Vet. Med. Assoc.	Dr. Stern, extension veterinarian and professor of veterinary sciences, said veterinarians are interested and want a veterinary school anywhere.	Veterinarians in N.J. Vet. Med. Assoc. are active.

	After the president of the U. of Conn. decided not to use an appropriated $2.5 million in the late 60's the veterinarians of Conn. requested a visit by Dean Soutter of the U. of Mass. Medical School to consider Massachusetts undertaking such a school. (11.7)	Public interest 20 years. (8.8)	(7.3)
25. There are other satellite facilities which could be used by the veterinary medical students. (Example: New England Primate Center, New England Wildlife Center, Veterans Hospital).	See Appendix F (10.2)	See Appendix F (5.7)	See Appendix F (7.9)
Total Rating – General Campus Criteria	(197.7)	(180.3)	(149.8)
COLLEGE OF AGRICULTURE CRITERIA			
1. The college has a veterinary science department or equivalent.	Yes (11.4)	Yes (11.4)	Yes (11.4)
2. There is a library or portions of a library assigned to veterinary science.	Yes (9.9)	No – incorporated in Amherst main library (3.3)	No (3.3)
3. There is an agricultural library with space available for the addition of veterinary medicine.	No separate agriculture library; 1,200 sq. ft. of veterinary science library used by agriculture students along with main campus library (3.7)	No – incorporated in Amherst main library (3.7)	No – agriculture library will be moved to Douglass College; only a research library will be left; no room for veterinary medicine (3.7)

Criteria	*University of Connecticut Storrs Campus*	*University of Massachusetts Amherst Campus*	*Rutgers University New Brunswick Campus*
4. The college has an agricultural experiment station.	Yes (12.6)	Yes (12.6)	Yes (12.6)
5. The college has a veterinary extension program.	Yes (8.9)	Yes – program for dairy farms (livestock) (6.3)	Yes (8.9)
6. The college has a continuing education program for veterinarians.	Yes – send faculty out to teach, the program is not highly structured (veterinarians and department of pathobiology.) (9.9)	Yes – programs for practitioners quite limited, directed towards major livestock disease problems (especially diseases of cattle), excludes big part of profession (small animal, public health, laboratory animal medicine, surgery) (6.6)	No – continuing education provided by other organizations throughout the state; New Brunswick may offer it some day. (3.3)
7. The college offers an animal technician training program.	Yes – at two year school level (the Radcliffe Hicks School of Agriculture), labeled animal science program (7.8)	Yes – Stockbridge School, Laboratory Animal Management (7.8)	No (2.6)
8. The college has a division of laboratory animal resources to serve the entire university.	Yes (10.2)	No (3.4)	No (3.4)
9. There is an animal research farm affiliated with the university.	Yes – 300+ acres (4 miles from campus) (11.7)	No (3.9)	No (3.9)

10. There is an effective biomedical research program.	11.75 FTE's Total research budget $544,960 (11.7)	8.2 FTE's Total research budget $350,000 (7.8)	12 FTE's Total research budget $303,671 (8.5)
Department of Veterinary Science			
1. The department offers a program in pre-veterinary medicine.	Yes (10.2)	Yes (10.2)	Yes (10.2)
2. There is an existing M.S. program.	Offers M.S. in animal diseases (8.7)	Offers M.S. in animal science, M.S. in wildlife (8.7)	Yes – M.S. in animal science. Areas of specialization: animal breeding and genetics, animal physiology, animal nutrition, animal pathology (8.7)
3. There is an existing Ph.D. program.	Offers Ph.D. in animal diseases. Specialty areas: bacteriology, pathology, virology (9.3)	Offers 1. Ph.D. in animal science, 2. Ph.D. in wildlife and fisheries biology. (8.3)	Ph.D. in animal science. Areas of specialization: animal breeding and genetics, animal physiology, animal nutrition, animal pathology (8.3)
4. There is an existing M.S. and Ph.D. program.	Yes (9.9)	Yes (9.9)	Yes (9.9)
5. The department offers a residency program.	No (2.8)	No (2.8)	No (2.8)
6. The department offers an internship program.	No (2.2)	No (2.2)	No (2.2)
7. The department offers a residency and internship program.	No (2.6)	No (2.6)	No (2.6)

Criteria	*University of Connecticut Storrs Campus*	*University of Massachusetts Amherst Campus*	*Rutgers University New Brunswick Campus*
8. The department operates a state diagnostic laboratory.	Yes – one laboratory; accessions include small animals, farm animals, poultry, wild and laboratory animals, 10 D.V.M.'s (11.1)	Yes. One large animal – Amherst 4 D.V.M.'s FTE One poultry – Waltham 1 D.V.M. FTE (6.2)	Yes – two laboratories One poultry – New Brunswick One poultry – Vineland 3 D.V.M.'s total (6.2)
9. There is an effective veterinary extension-diagnostic service program.	$252,947 extension only (no data for diagnostic service) (6.6)	$405,000 (9.9)	No data provided (3.3)
10. There is an effective veterinary research program.	$544,960 (11.1)	$320,000 (7.4)	No data provided (3.7)
Total Rating – College of Agriculture Criteria	(172.2)	(135.0)	(119.5)

APPENDIX F

SATELLITE FACILITIES

CONNECTICUT
Storrs – Farmington

	Name	*Location*
1. Industrial research laboratory	Pfizer, Inc.	Groton, Conn.
	Arbor Acres Farm, Inc.	Glastonbury, Conn.
	Pratt and Whitney Aircraft	East Hartford, Conn.
	General Dynamics (Electric Boat Division)	Groton, Conn.
2. State and/or federal biomedical research laboratory	State Dept. of Health	Hartford, Conn.
	Hartford Hospital*	Hartford, Conn.
	Navy Underwater	New London, Conn.
3. Pharmaceutical laboratory	Pfizer, Inc.	Groton, Conn.
	American Cyanamid Co. Laboratories in New Jersey	Pearl River, N.Y.
4. Nutrition laboratory	Dept. of Nutritional Sciences, College of Agriculture and Natural Resources, Univ. of Conn.	Storrs, Conn.
	Massachusetts Institute of Technology	Cambridge, Mass.
	Natick – U.S. Army	Natick, Mass.
5. Department of Health laboratory	Conn. Dept. of Health	Hartford, Conn.
6. Meat packing plant	COPACO	Bloomfield, Conn.
	Morris Packing Co.	Hartford, Conn.
	Home Pride Provisions, Inc.	Stafford Springs, Conn.
7. Agriculture research & development center	Univ. of Conn. Agr. Exp. Station	Storrs, Conn.
	Conn. Agr. Exp. Station	New Haven, Conn.
	Univ. of Mass. Agr. Exp. Station	Amherst, Mass.
	Univ. of New Hampshire Agr. Exp. Station	Durham, N.H.
	Univ. of Rhode Island Agr. Exp. Station	Kingston, R.I.
	Arbor Acres Farms, Inc.	Glastonbury, Conn.
	U.S.D.A. Regional Lab.	Philadelphia, Pa.

*A 925-bed hospital with a small but active research program in surgery, toxicology, microbiology, behavioral psychology, and possibly others.

Three staff members of the Department of Pathobiology hold courtesy staff appointments: Drs. Kenyon, Kersting, and Nielsen. Two staff members of Hartford Hospital are consultants to the College of Agriculture and Natural Resources: Drs. Beckett and Tennant (Pathology).

8. Toxicology laboratory**	Univ. of Conn. Medical Center	Farmington, Conn.
	Pesticides Laboratory	Storrs, Conn.
	Conn. Agr. Exp. Station	New Haven, Conn.
	State Dept. of Health	Hartford, Conn.
	Dept. of Pathobiology, College of Agr. & Natural Resources	Storrs, Conn.
	Hartford Hospital	Hartford, Conn.
9. Marine animal laboratory	Marine Sciences Inst. (incl. the Marine Research Lab.) Univ. of Conn.	Groton, Conn.
	Noank Laboratory, Univ. of Conn.	Noank, Conn.
	New York City	New York, N.Y.
10. Environmental health laboratory	None – State has new Dept. of Environmental Protection	Hartford, Conn.
11. State and/or federal livestock farm	College of Agriculture and Natural Resources, Univ. of Conn.	Storrs, Conn.
	Osborne Division of Conn. State Prison	Enfield, Conn.
12. Human hospitals	Bristol Hospital	Bristol, Conn.
	Hartford Hospital	Hartford, Conn.
	Institute of Living	Hartford, Conn.
	Middlesex Memorial Hospital	Middletown, Conn.
	Mt. Sinai Hospital	Hartford, Conn.
	New Britain General Hospital	New Britain, Conn.
	Newington Children's Hospital	Newington, Conn.
	St. Francis Hospital	Hartford, Conn.
	Veterans Administration Hospital	Newington, Conn.
13. Diagnostic laboratories	1 – Domestic, Wildlife, Zoo	Storrs, Conn.

**None of these laboratories offers *complete* toxicological services; however, most requirements can be met by one or more of the existing facilities.

14. Other	Northeastern Res. Center for Wildlife Diseases, College of Agr. & Natural Resources, Univ. of Conn.	Storrs, Conn.
	Livestock exhibition, Eastern States Exposition (each September)	West Springfield, Mass.
	Willington Wild Animal Farm. Sixty species of animals and birds, including large cats (very cooperative)	Willington, Conn.

MASSACHUSETTS
Amherst – Worcester

	Name	*Location*
1. Industrial research laboratory	Astra Chemical Company Mason Laboratory	Springfield, Mass. Worcester, Mass.
2. State and/or federal biomedical research laboratory		
3. Pharmaceutical laboratory	MIT U. of Massachusetts	Cambridge, Mass. Amherst, Mass.
4. Nutrition laboratory		
5. Department of Health laboratory	Western Massachusetts State Public Health Center	Amherst, Mass.
	State Dept. Health Lab.	Amherst, Mass.
6. Meat packing plant		
7. Agriculture research & development center	South Deerfield Animal Science Department	South Deerfield, Mass.
8. Toxicology lab.	Public Health Center	Amherst, Mass.

9.	Marine animal lab.	under development	Boston, Mass.
10.	Environmental health laboratory		
11.	State and/or federal livestock farm		
12.	Human hospitals	Worcester City Hospital	Worcester, Mass.
		St. Vincent Hospital	Worcester, Mass.
		Memorial Hospital	Worcester, Mass.
		Wesson Women's Hospital	Springfield, Mass.
13.	Diagnostic laboratories	1 – Poultry	Amherst, Mass.
		1 – Large animal	Waltham, Mass.
14.	Other	New England Regional Primate Research Center	Southboro, Mass.
		Worcester Research Foundation	Worcester, Mass.
		Woods Hole Oceanographic Inst. (marine sea grant)	Woods Hole, Mass.
		Charles River Breeding Laboratories	Wilmington, Mass.
		Dept. of Veterinary and Animal Science Univ. of Mass.	Amherst, Mass.

NEW JERSEY
Piscataway – New Brunswick

		Name	*Location*
1.	Industrial research laboratory	Bureau of Biological Research, Rutgers University	Piscataway, N.J.
2.	State and/or federal biomedical research laboratory	New Jersey Division of Animal Health Laboratory	Trenton, N.J.
		Contagious Disease Diagnostic Laboratory, Direction of New Jersey	Trenton, N.J.
		Medical School	Trenton-Newark-New Brunswick, N.J.

3. Pharmaceutical laboratory (25 in New Jersey)	Schering	Bloomfield, N.J.
	Johnson & Johnson	New Brunswick, N.J.
	Biodynamics	East Millstone, N.J.
	Hoffman LaRoche	Nutley, N.J.
	Squibb	New Brunswick, N.J.
	Cyanamid	Princeton, N.J.
	Merck	Rahway, N.J.
	Pitman-Moore	Washington Crossing, N.J.
	Rutgers School of Pharmacy	New Brunswick, N.J.
4. Nutrition laboratory	Rutgers College of Agriculture and Environmental Sci.	New Brunswick, N.J.
5. Department of Health Laboratory	State Dept. of Health	Trenton, N.J.
6. Meat packing plant	Allen Packing-Beef, Swine	Elizabeth, N.J.
	Under State	
	Under State	
	Under State	
	Under State	
	Under State	Passaic, N.J.
	Federal USDA	Newark, N.J.
7. Agriculture research and development center	Merck	Readington, N.J.
	Merck	Cream Ridge, N.J.
	Am. Cyanamid	Princeton, N.J.
8. Toxicology laboratory	Animal Science Dept., College of Agriculture and Environmental Sciences, Rutgers	Rutgers, New Brunswick, N. J.
	Dept. of Agriculture or State Police Lab.	Trenton, N.J.
9. Marine animal laboratory	Rutgers Zoology Dept.	Fort Hancock, N.J. Cape May, N.J. Atlantic City, N.J.
10. Environmental health laboratory	College of Agriculture and Environmental Sciences, Rutgers	New Brunswick, N.J.

11. State and/or federal livestock farm	Animal Science Dept., College of Agriculture and Environmental Sciences, Rutgers	New Brunswick, N.J.
12. Human hospitals	Muhlenberg Hospital	Plainfield, N.J.
	Hunderton Med. Center	Flemington, N.J.
	Princeton Med. Center	Princeton, N.J.
	Middlesex Gen. Hosp.	New Brunswick, N.J.
	Raritan Valley Hosp.	Greenbrook, N.J.
	St. Peter's Gen. Hosp.	New Brunswick, N.J.
	Perth Amboy Gen. Hosp.	Perth Amboy, N.J.
	Roosevelt Hosp.	Edison, N.J.
13. Diagnostic laboratories	1 – Poultry	Rutgers, New Brunswick, N.J.
	1 – Poultry	Vineland, N.J.
14. Other	Space Research Center RCA	Cranbury, N.J.
	Fort Dix – Army & Ajr Force Medical Unit	Fort Dix, N.J.
	Doris Duke Estate (cattle leukemia project; veterinary students welcomed; equine anemia research)	Somerville, N.J.
	USDA Quarantine Station	Clifton, N.J.
	USDA	Plum Island, N.Y.
	All Medical Schools in	New York City, N.Y.
	Animal Medical Center	New York City, N.Y.
	ASPCA	New York City, N.Y.

APPENDIX G

MAPS OF POTENTIAL LOCATIONS
FOR THE
PROPOSED REGIONAL COLLEGE
OF VETERINARY MEDICINE

The potential locations for the veterinary medical facilities, as outlined on the following maps, were indicated by campus representatives and personnel on the site visits to each of the six candidate campuses.

Figure G-1 Potential Location for the Proposed College of Veterinary Medicine
Farmington, Connecticut

Figure G-2 Potential Location for the Proposed College of Veterinary Medicine
Worcester, Massachusetts

Figure G-3 Potential Location for the Proposed College of Veterinary Medicine
Piscataway, New Jersey

Figure G-4 Potential Location for the Proposed Veterinary Medical Research Farm
Piscataway, New Jersey

Figure G-5 Potential Location for the Proposed College of Veterinary Medicine
Storrs, Connecticut

Figure G-6 Potential Location for the Proposed Veterinary Medical Research Farm
Storrs, Connecticut

Figure G-7 Potential Location for the Proposed College of Veterinary Medicine
Amherst, Massachusetts

Figure G-8 Potential Location for the Proposed College of Veterinary Medicine
New Brunswick, New Jersey

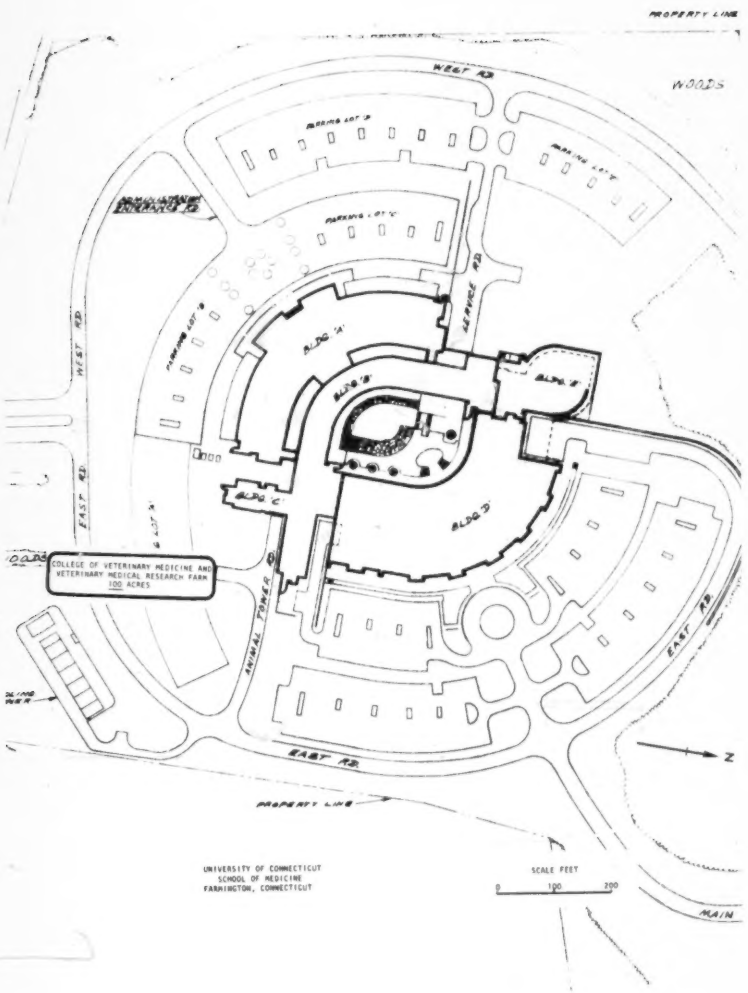

FIGURE G-1. Potential Location for the Proposed College of Veterinary Medicine Farmington, Connecticut

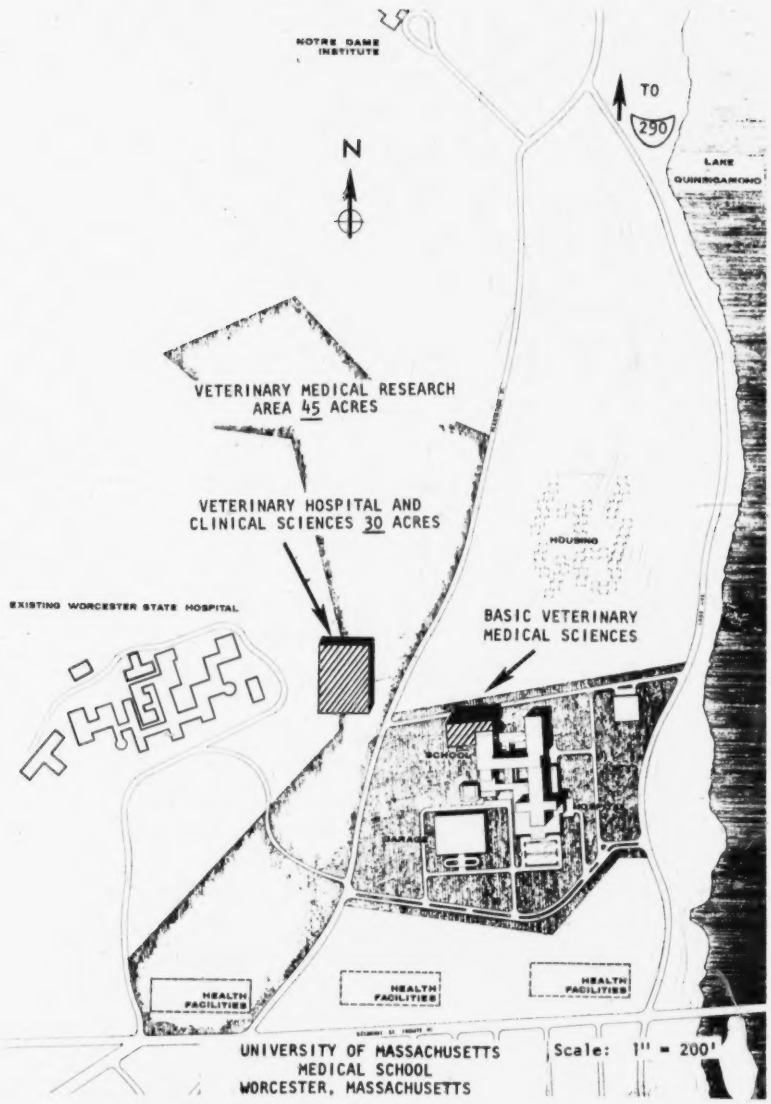

FIGURE G-2. Potential Location for the Proposed College of Veterinary Medicine Worcester, Massachusetts

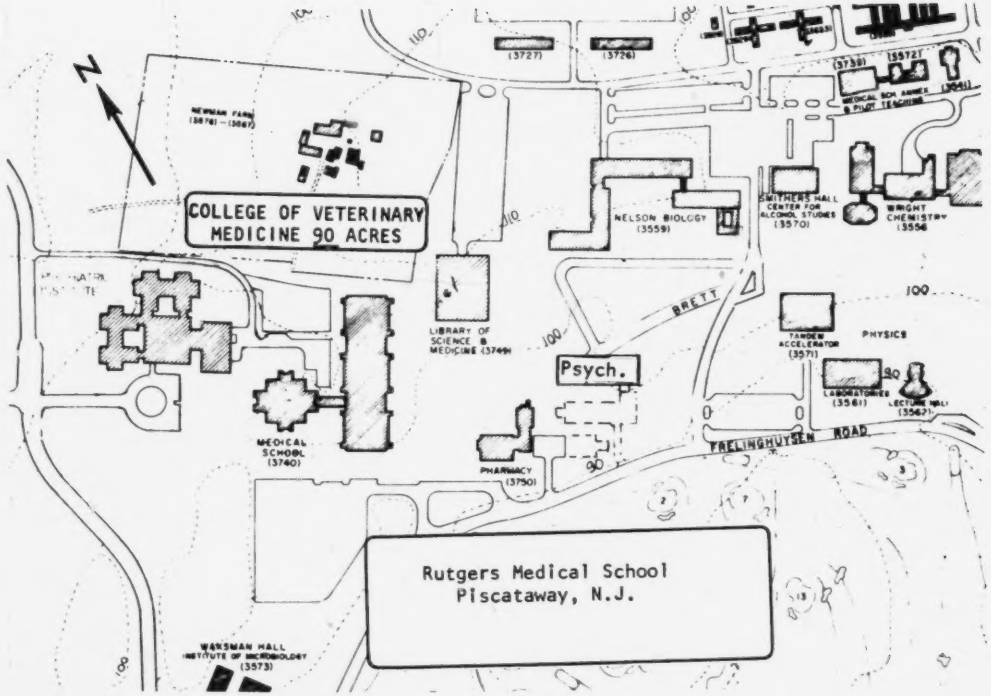

FIGURE G-3. **Potential Location for the Proposed College of Veterinary Medicine Piscataway, New Jersey**

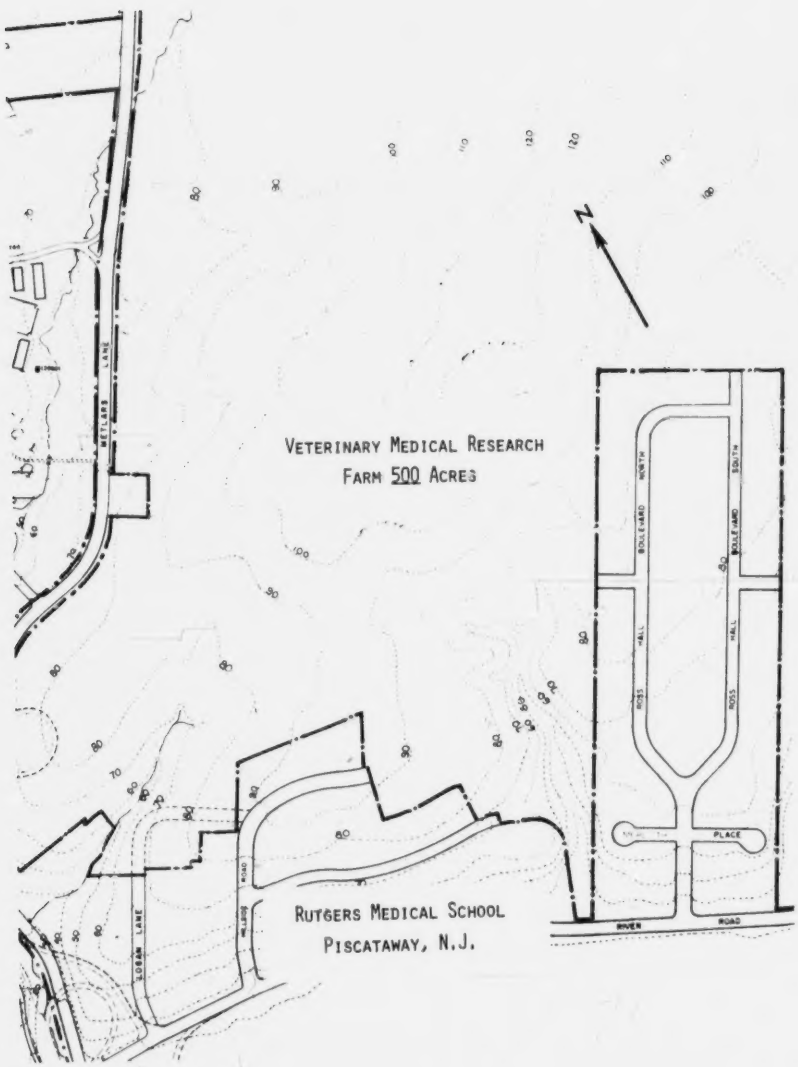

FIGURE G-4. **Potential Location for the Proposed Veterinary Medical Research Farm Piscataway, New Jersey**

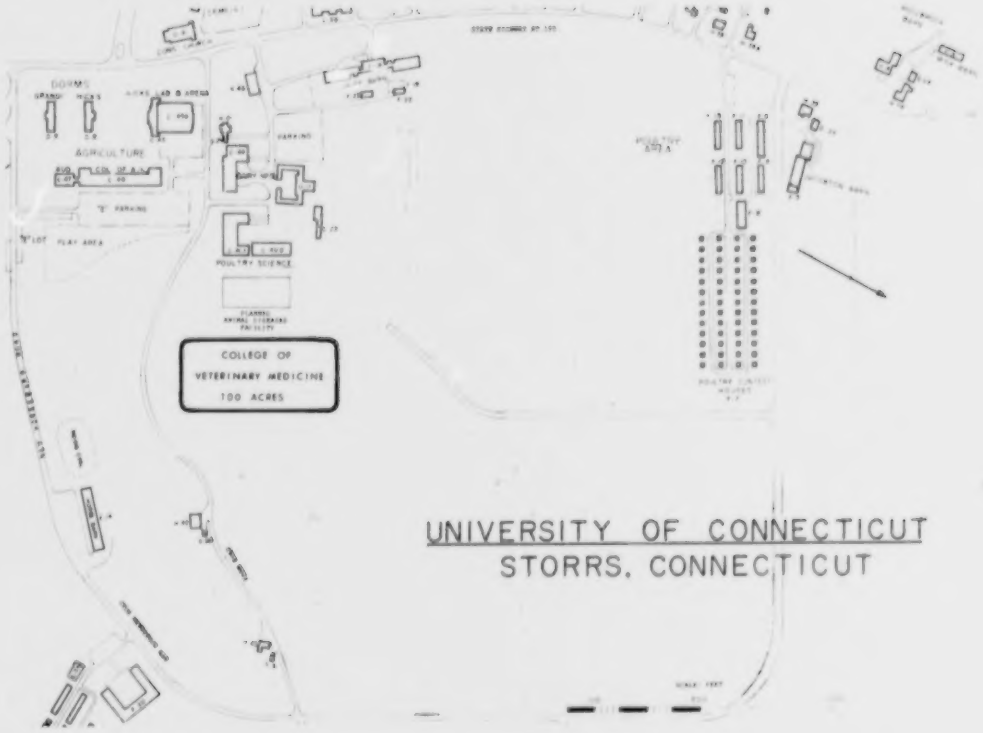

FIGURE G-5. Potential Location for the Proposed College of Veterinary Medicine Storrs, Connecticut

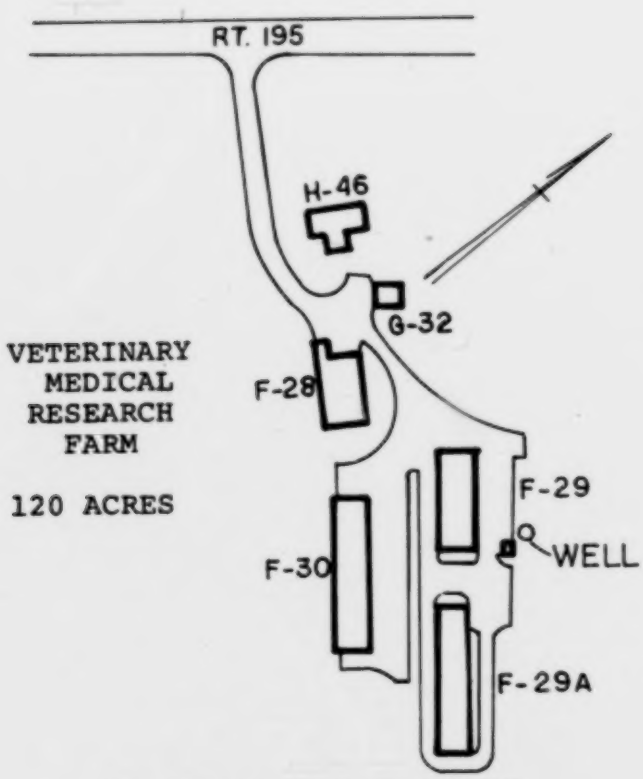

FIGURE G-6. Potential Location for the Proposed Veterinary Medical Research Farm Storrs, Connecticut

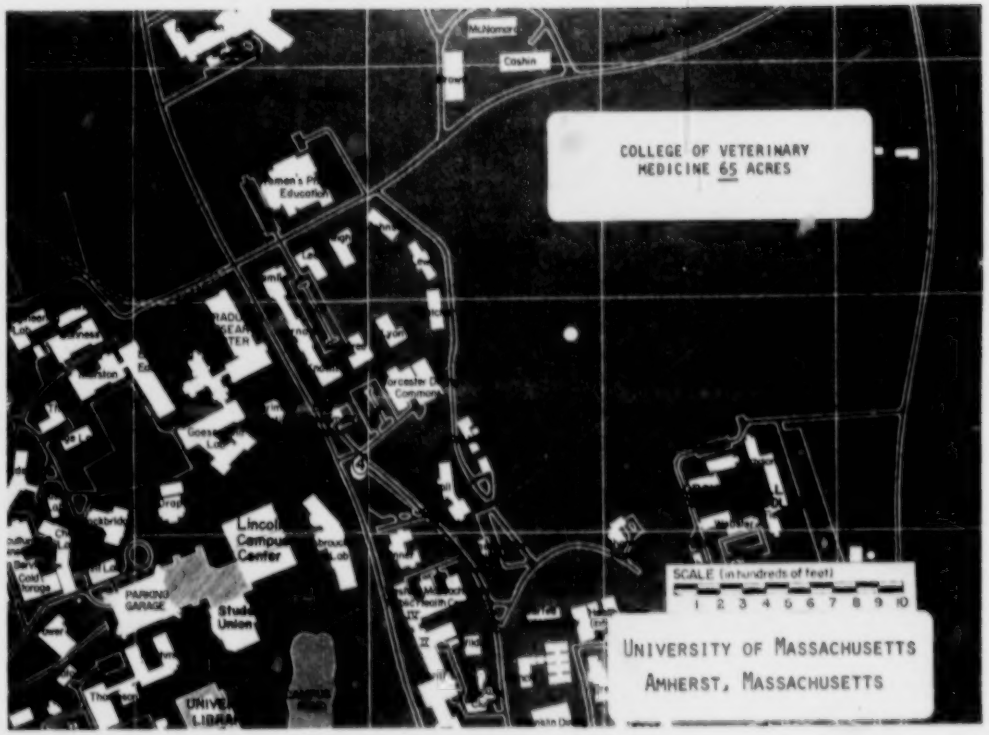

FIGURE G-7. Potential Location for the Proposed College of Veterinary Medicine Amherst, Massachusetts

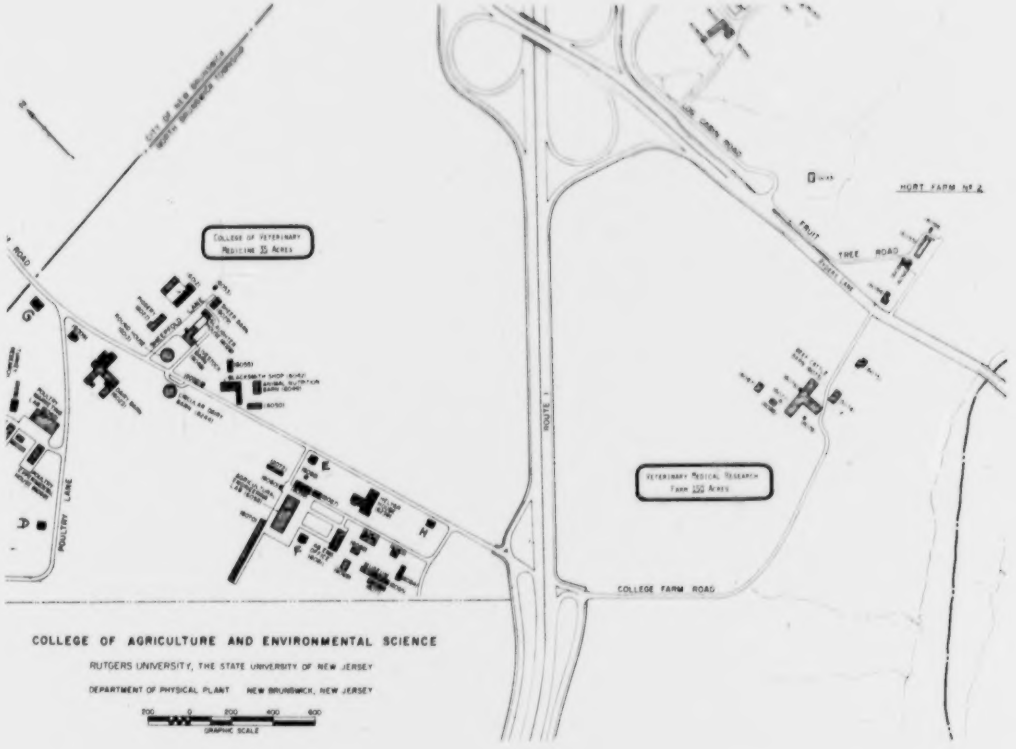
COLLEGE OF VETERINARY MEDICINE 35 ACRES
HORT FARM Nº 2
FRUIT TREE ROAD
ROUTE 1
VETERINARY MEDICAL RESEARCH FARM 100 ACRES
COLLEGE FARM ROAD
POULTRY LANE
COLLEGE OF AGRICULTURE AND ENVIRONMENTAL SCIENCE
RUTGERS UNIVERSITY, THE STATE UNIVERSITY OF NEW JERSEY
DEPARTMENT OF PHYSICAL PLANT NEW BRUNSWICK, NEW JERSEY
GRAPHIC SCALE

FIGURE G-8. Potential Location for the Proposed College of Veterinary Medicine New Brunswick, New Jersey

APPENDIX H

ILLINOIS PLANNING FACTORS

APPLICATION OF SPACE PLANNING FACTORS TO INSTITUTIONAL DATA

Space Calculations

			NASF
Office Space (202 personnel requiring office space x 135 sq. ft.)			27,270
Instructional Space			
Laboratories (6444 weekly student hours x 4.25 sq. ft.)			27,387
Animal Quarters (384 professional students x 16 sq. ft.)			6,144
Graduate Students and Faculty			
Laboratories			
Graduate Students (15 demand units* x 15 demand factor** x 100 headcount)	22,500		
FTE Faculty (6 demand units* x 15 demand factor** x 96 FTE)	8,640		
Total Laboratory Space		31,140	
Animal Quarters (Patient wards and other teaching and research animals)			
Graduate Students (100 headcount x 315 sq. ft.)	31,500		
FTE Faculty (96 FTE x 90 sq. ft.)	8,640		
Total Animal Quarters Space		40,140	
Total Graduate Student and Faculty Space			71,280
Sub-total			132,081
Storage (20% x Sub-Total)			26,416
Commons (384 professional students + 50 graduate student FTE x 2.5 sq. ft.)			1,085

*Demand Unit – A standard of measurement in determining laboratory space requirements based upon space needed by faculty and graduate students for individual investigative work.

**Demand Factor – The number by which the product of the demand unit and the number of faculty and graduate students is multiplied to give the total laboratory space required in a given field of study; 15 is the factor recommended for veterinary medicine.

Locker and Cleanup Space			
Students (384 professional students + 100 graduate student head-count x 10 sq. ft.)	4,840		
Staff (165 x 10 sq. ft.)	1,650		
Total Locker and Cleanup Space			6,490
Clinical Instruction (96 senior professional students x 782 sq. ft.)			75,072
Classroom Space (4246 weekly student hours x .92 sq. ft.)			3,906
Learning Resource Center			
Autotutorial Laboratory			
Approximately 4000 sq. ft. of space for classes of 96 students will be provided for the autotutorial laboratory from the total combined space provided for instructional laboratories, classrooms, and library.			
Library Space			
Stack Space (30,000 volumes plus periodicals and multi-media area equivalent to 15,000 volumes x .18 sq. ft.)		8,100	
Reader Space			
DVM Students (384 students x 7.5 sq. ft.)	2,880		
Graduate Students (100 students x 7.5 sq. ft.)	750		
Faculty (96 FTE x 3 sq. ft.)	288		
Total Reader Space		3,918	
Service Space for Veterinary Medicine Library (20% x Reading Space)		784	
Service Space for Main Library (5% x Reading Space)		196	
Total Library Space			12,998
Total NASF Required for a College of Veterinary Medicine with 96 Faculty and 1114 Students (Professional, Intern, Graduate, Resident, Continuing Education, and Technical)			258,048
			(Rounded to 258,050)

APPENDIX I

OHIO PLANNING FACTORS

APPLICATION OF SPACE PLANNING FACTORS TO INSTITUTIONAL DATA

Space Calculations

		NASF
Classrooms (4246 student contact hours x 1 sq. ft.)		4,246
Teaching Laboratories		
Laboratories (6444 weekly contact hours x 3.9 sq. ft.)	25,132	
Animal Quarters (6444 weekly contact hours x 2 sq. ft.)	12,888	
Total Teaching Laboratory Space		38,020
Research Laboratories		
Faculty		
Laboratories (24 FTE x 275 sq. ft.)	6,600	
Animal Quarters (24 FTE x 756 sq. ft.)	18,144	
Graduate Students		
Laboratories (50 FTE x 400 sq. ft.)	20,000	
Animal Quarters (50 FTE x 504 sq. ft.)	25,200	
Total Research Space		69,944
Office, Conference and Service		
Faculty (96 FTE x 160 sq. ft.)	15,360	
Graduate Students (50 FTE x 200 sq. ft.)	10,000	
Total Office, Conference and Service Space		25,360
Clinical Teaching and Research Facilities		
Senior Students (96 FTE x 704 sq. ft.)	67,584	
Faculty (24 FTE x 254 sq. ft.)	6,096	
Graduate Students (50 FTE x 156 sq. ft.)	7,800	
Total Clinical Teaching and Research Facilities		81,480
College Administration (12 FTE offices x 160 sq. ft.)		1,920
Sub-Total		220,970
Storage and Miscellaneous (10% x sub-total)		22,097
Commons (384 professional students x 4 sq. ft.)		1,536

Lockers (649 lockers required x 5 sq. ft.)			3,245
Learning Resource Center			
Autotutorial Laboratory			
Approximately 4000 sq. ft. of space for classes of 96 students will be provided for the autotutorial laboratory from the total combined space provided for instructional laboratories, classrooms, and library.			
Library Space			
Stack Space (30,000 volumes plus periodicals and multi-media area equivalent to 15,000 volumes x .18 sq. ft.)		8,100	
Study Space			
DVM Students (30% x 384 students x 30 sq. ft.)	3,456		
Faculty and Graduate Students (10% x 208 x 40 sq. ft.)	832		
Total Study Space		4,288	
Sub-total		12,388	
Library Service (33% x stack and study space sub-total)		4,088	
Total Library Space			16,476
Total NASF Required for a College of Veterinary Medicine with 96 Faculty and 1114 Students (Professional, Intern, Graduate, Resident, Continuing Education, and Technical)			264,324
			(Rounded to 264,320)

APPENDIX J

PRE-ACCREDITATION INSTRUCTIONS

AMERICAN VETERINARY MEDICAL ASSOCIATION
600 SOUTH MICHIGAN AVENUE · CHICAGO, ILLINOIS 60605 · PHONE: 312 / 922-7930

March 19, 1973

Dr. Clarence Cole
College of Veterinary Medicine
Ohio State University
Columbus, Ohio 43210

Dear Clarence:

This is in response to our telephone conversation on Friday regarding the accreditation activities relating to providing the statement of "reasonable assurance" of accreditation. On November 18, 1969, the U.S. Commissioner of Education granted official recognition to the AVMA for its pre-accreditation category of "reasonable assurance." A developing college of veterinary medicine, wishing to obtain the earliest recognition of eligibility for future accreditation, should keep the Council on Education of the AVMA advised, particularly during its planning and early developmental stages. Prior to admitting its first class of students or prior to its first application for construction or other funds from the federal government, it should request an evaluation by the Council on Education. Following this, the Council would designate a team of two or more members to conduct an evaluation on site of the developing college. At that time, the dean should be employed and he should be in a position to do and provide the following:

Describe the organization of the university;
Describe the proposed administrative organization of the college;
Describe the proposed faculty and staff, including tentative numbers of each rank;
Describe enrollment projections;
Describe admission policies;
Show plans for physical facilities to be constructed and plans for renovation of currently available facilities, including description of assigned land area for school;
Show plans for library and other learning resources;
Describe proposed curriculum;
Show availability of clinical teaching material; and
Describe proposed budget.

Based upon the evaluation, the Council will determine whether or not there is indication of reasonable assurance that the new college will meet the requirements of the Essentials of an Acceptable Veterinary Medical School by the time it has been in operation for two years. At this point, an evaluation would be made again with the intent to change the classification to "provisional accreditation" as provided for in the Essentials.

I hope this is satisfactory. Please let us know if you have any questions regarding it. I look forward to meeting with you on April 20.

Sincerely,

W. M. Decker, D.V.M.
Director of Scientific Activities

WMD:lb

APPENDIX K

ESSENTIALS OF AN ACCEPTABLE VETERINARY MEDICAL SCHOOL

(As Revised by the Council on Education and Approved by the House of Representatives, July 1969)

I. AIMS AND PURPOSES OF THE COUNCIL

1. To outline means and methods for progressive improvement of veterinary medical education. This requires the correlation of scientific knowledge, clinical experience, procedures, and techniques of veterinary medical education, and the socioeconomic conditions of the times.

2. To establish and apply criteria for the accreditation of schools and colleges which offer courses leading to a degree in veterinary medicine. These shall include admission requirements, the undergraduate curriculum, research programs, and graduate training in veterinary medicine.

3. To publish periodically the accreditation status of the schools and colleges as determined by the Council.

4. To establish standards of proficiency by correlating all the activities associated with veterinary medical education.

5. To study methods of teaching in veterinary medical schools and colleges with the objective of progressive improvement.

6. To support schools in their objective of insuring that a career of teaching in veterinary medicine will attract qualified personnel.

7. To study the needs for establishing courses that will enable veterinarians to to meet changing demands.

II. ESSENTIAL REQUIREMENTS

1. *Organization.* A school or college of veterinary medicine should find its most advantageous environment if it is part of an accredited institution of higher learning. In the best interests of both the institution and the veterinary medical school, the latter requires the same recognition and autonomy as other professional schools. A veterinary medical school may be fully accredited by the Council only when it is operated as a major administrative division of the parent institution and under the direction of a dean who is a veterinarian.

2. *Finances.* The school's appropriations, together with other sources of revenue such as endowments and income from fees, are considered important factors in the evaluation of the institution. Clinical services must be operated

primarily for the purpose of teaching rather than as a source of revenue. The school's financial records are of interest to the Council in determining per capita costs of education. The veterinary medical school shall be fully accredited by the Council only when the financial resources are assured to be sufficient to meet requirements.

3. *Physical Plant.* All aspects of the physical plant and equipment shall be adequate to meet the requirements of the institution's objective.

4. *Enrollment.* The number of students enrolled in a veterinary medical school should be in keeping with physical facilities, clinical accessions, organization, and the number and qualifications of the school's faculty and administrative personnel.

5. *Library.* Adequate library facilities are esential to a sound program of veterinary medical education and research. The library should be established as a part of the veterinary medical school; it should be well housed, conveniently located, and available for the use of students and faculty at all reasonable hours. It should be administered by a professionally trained or experienced librarian and should be adequately sustained both for operation and for the purchase of current periodicals and other accessories of veterinary medical importance.

6. *Admission.* Selection of students should be the responsibility of a representative committee of the faculty approved by the dean of the school. The committee shall consider applications of candidates who have met the minimum academic requirements, including successful completion of two years of college study, or its equivalent, in an accredited college. Prescribed subjects should include English, physics, biology, chemistry (inorganic and organic), the humanities and social studies and other prerequisite subjects to the undergraduate course in veterinary medicine. The committee should also consider other factors such as character, personality, health, experience with animals, general knowledge, and motivation.

7. *Faculty.* In accordance with a university's stated objectives, members of the veterinary medical faculty should have adequate academic qualifications. These qualifications shall include general and special training. Research activities and contributions to original knowledge are important criteria in evaluating the faculty and the school. There should be evidence of a balanced program of teaching and research when the faculty is considered as a whole. The policy of faculty recruitment should recognize the need in professional education to seek personnel specifically qualified for teaching.

The use of part-time instructors with valuable training and experience should be encouraged, but their services should only supplement the full-time faculty.

Reasonable security of tenure and attractiveness of position must be assured to maintain stability, continuity and competence of faculty.

8. *Professional Curriculum.* The curriculum should permit adjustment to the needs of veterinary medicine as a growing and expanding science; it should be sufficiently flexible to permit adjustments as suggested by experience and advances in knowledge.

The curriculum should provide a sound foundation in the fundamentals of veterinary medicine, thereby equipping the student for the many responsibilities of his profession. It should develop habits of mind that will inspire the student to continue to educate himself throughout life and fully appreciate his professional obligations.

In its evaluation, the Council will study the curriculum as a whole and in terms of its related parts. The professional curriculum shall extend over a period of at least four academic years of not less than 32 weeks each, averaging at least 30 clock hours per week.

The curriculum should provide adequate instruction in the following subjects as applied to the various species of animals; anatomy, including histology and embryology; physiology; pharmacology; microbiology, including bacteriology, mycology, virology and immunology; pathology; parasitology; biochemistry; internal medicine; preventive medicine and public health; obstetrics; surgery; radiology; biometrics; anesthesiology; ophthalmology; and professional and public relations.

In the clinical years, there is no adequate substitute for the "case method" of instruction. Students shall be supervised individually for applied training in hospital wards, ambulatory clinics, diagnostic and necropsy laboratories, as well as in disease control and veterinary public health. Such assignments should occupy most of the senior year and should be correlated with informal conferences, rounds in the hospital, and library assignments. Students must keep records of such activities.

9. *Clinical Facilities.* An accredited school of veterinary medicine must maintain a hospital for the care and treatment of domestic animals. In addition, it must maintain a supervised ambulatory or out-patient clinic in which students are afforded ample opportunities to obtain experience under farm conditions.

The hospital should be provided with modern sanitary facilities for examination and humane treatment of all types of animals. It should be adequately lighted and ventilated. The wards should be heated to provide temperatures appropriate for the species of animals being hospitalized. There should be a sufficient number of stalls and cages to house the number of cases deemed necessary for efficient training of students enrolled during the clinical years.

The equipment should be modern and include apparatus necessary for examination, diagnosis, and treatment, both surgical and medical, of all animals. The large and small animal clinics must be provided with a pharmacy and proper sterilization facilities. Isolation quarters must be provided in which the students may be properly trained in quarantine procedures under the supervision of a qualified staff member.

An adequate system of case records must be maintained. This includes accurate information of history, examination, diagnosis, treatment, response to treatment, and final results. In fatal cases, a necropsy should be conducted and the report attached to the complete case record including all pertinent data.

An approved system of classification and nomenclature of diseases and procedures should be used for recording all cases.

While it is unrealistic to specify the precise number of hospital cases and out-patients required to provide adequate clinical training, it is essential that a sufficient number and variety of surgical and medical cases be available.

10. *Teaching Aids.* There shall be an adequate collection of teaching aids for each subject, including specimens (fixed and fresh), modern audiovisual material, auxiliary apparatus, and animals for demonstration purposes.

III. STATEMENT OF GENERAL POLICY

The aims and purposes of the Council are to promote active progress in veterinary medical education in the various schools and colleges, with full accreditation of them as the ultimate goal. In fulfilling this function, the Council will encourage and assist schools to meet requirements.

Upon request, the Council will consider evaluation of a newly established school at any stage of its development, making accreditation possible after the completion of instruction of the first two professional years.

If an accredited school contemplates fundamental changes in its administrative organization, association with the parent institution, curriculum, faculty organization, instructional program, or stated objectives, the Council should be given an opportunity to review the proposed changes before they are adopted.

IV. CLASSIFICATION

Schools visited by the Evaluation Committee will be placed in one of the following classifications by the Council with respect to the prescirbed Essentials of an Acceptable Veterinary Medical School:

1. *Full Accreditation.* Those schools which comply with the aforementioned Essentials.

2. *Provisional Accreditation.* Those new schools which have not been in existence long enough to complete the professional program but which have complied with the prescribed conditions of this Council for at least the first two years of the professional curriculum.

3. *Confidential Probation.* Those schools with significant deficiencies toward compliance with the Essentials. These deficiencies will be discussed with officials of the schools concerned but will not be disclosed to the public.

4. *Public Probation.* Those schools with continuing significant deficiencies in the Essentials, or those schools with serious deficiencies.

5. *Accreditation Withheld.* Those schools which, in the opinion of the Council, do not fall into any of the above categories.

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The New England Board of Higher Education
40 Grove Street, Wellesley, Mass. 02181
Tel. 617-235-8071